Part II

Improving

EQAO

Results

Part II demonstrates action research in practice with a focus on analyzing EQAO provincial test results to inform strategies to improve student achievement.

Building Bridges
Between the Theoretical and the Practical

Ron Wideman and Jackie Delong

The articles in this issue are all by classroom teachers and school-board consultants. Classroom teacher Anda Kett writes about using EQAO test results to inform her practice. Classroom teacher Elaine Hamilton and consultant Heather Knill-Griesser collaborate to describe their efforts to improve student writing. Consultant Cilla Dale describes what she learned about developing a relationship of trust with the classroom teachers with whom she works. Finally, Janet Trull writes about her experience in a team of five centrally-assigned early literacy teachers attempting the seemingly overwhelming task of improving early literacy programs in seventy-five schools.

The accounts tell the writers' stories, their trials and tribulations trying to improve their own practice, and what they learned as a result. They transmit a passion for professional learning and teaching and a dedication to school improvement that can inspire others to follow. We were interested in the differences of opinion these articles generated among our reviewers. Some loved the informal, flowing, narrative accounts of the inquiry of teachers. Others wished for more structured presentation of formal research papers. The purpose of this journal has, from its inception, been to provide a forum for a range of action research writing. We don't want to invest in black and white polarities about what constitutes a research article but rather to contribute to the knowledge base of the profession by celebrating the voices of teachers writing from their own experience. Some of them will be writing for academic accreditation and some of them will not. Whereas in the previous issue, all articles were derived from University degree work and reflect the criteria of academic writing, all of these articles are informal research projects. As an editorial board, we value both.

Rather than organizing the material into sections titled Methodology, Findings, and Conclusions, these teachers integrate writing about their inquiry process and what they learned into a more informal narrative. This kind of story-telling may make the teacher's research more accessible to practising teachers. We have also found in our work with teachers, that informal research projects and writing are often precursors to academic study.

They provide the writers with personal experience that inspires them to seek out and integrate more formal research. Similarly, such articles can illustrate through case study what has also been learned through more formal research and, more importantly, can raise questions that lead to further study. We have a real interest in building bridges between the theoretical and the practical, the formal and the informal, so that both kinds of research and writing are seen to be of value in building professional knowledge.

Improving Student Learning Through Corrective Action

What can be done in the classroom
to ensure that girls feel increased confidence
and self-esteem when doing math?

Diane Clark

Diane Clark
Grade 6 Teacher
Lynndale Heights Public School

Diane Clark is currently a grade six teacher and Computer Site Administrator at Lynndale Heights Public School in Simcoe.

She earned her B.A. through McMaster University and achieved her B.Ed. at the University of Toronto. Her areas of interest are computer technology, language, mathematics and action research.

ABSTRACT:

The process of action research was new to me when I began this research in October of 1999. The EQAO results for the previous school year had just been released and, while pleased with the achievement levels of my grade six students, I was quite surprised with the student attitude component of the testing. I knew that the females in the class had achieved level threes and fours with me in many of the math strands, and on the EQAO assessment, but their attitudes towards math were very negative.

Action research provided me the opportunity to delve further into the source of these attitudes and helped me to pinpoint areas requiring change in my classroom. It was a true learning experience for me!

1. School profile:

Lynndale Heights Public School opened in the fall of 1998 in a quiet residential area of Simcoe, Ontario, and brought together 260 kindergarten to grade eight students from five local schools. While varying abilities is always a reality in any classroom, teachers at Lynndale found the students' divergent strengths and weaknesses to be quite pronounced. There were large gaps in their backgrounds and teachers quickly became aware that the curriculum, in many cases, could not be taught until these gaps were filled. In grade six there were 42 students; 27 were in my class, and the other 15 were the classroom next door

2. Focus

When looking at the 1999 EQAO Provincial Assessment results for the grade six students in the fall of 1999, the varying attitudes of the males and females towards mathematics were quite surprising. The percentage of girls who, on the questionnaire, stated that they liked math was a disturbing 33 whereas 73% of the males liked math. Even more striking was the difference in attitude when asked if they were good at math (girls 33%, and boys an overwhelming 80%).

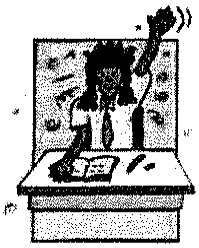
This did not seem right because I knew that with that group of students I had had many very strong girls who appeared to be confident when doing math, felt comfortable when volunteering answers, wrote long explanations in their math journal, and met a lot of success on daily assigned work and tests.

I then examined the actual concrete levels of achievement in the EQAO assessment, and my suspicions were confirmed: more girls than boys had achieved level 3 or 4 on the math components of the assessment! Why did 67% of the girls think that they were not good at mathematics? I knew that going through the action research process would help me to find the answer to this question.

Liana Thompson, grade seven teacher at Lynndale Heights and current teacher of many of the students reflected in the 1999 assessment results, examined the results with me and, together, we determined that our research topics would be:

1. *Why do more girls than boys believe that they are not succeeding at math?*

and



2. *What can be done in the classroom to ensure that more girls feel increased confidence and self-esteem when doing math?*

3. Process:

3.1 Rationale: What did I do? What data did I collect?

After giving the research topics much thought, Liana and I formulated a plan of action which would provide us with some insight into attitudes of the students in regards to math. We immediately did the following:

4. Steps:

4.1 Research and Planning

We called a meeting of all intermediate teachers to discuss our concerns and intentions and decided collectively to change our Teacher Advisor Group (TAG) groupings to single gender for the second term so that Liana and I could focus on oral responses of female students through group discussion

We arranged a meeting with Bob Ogilvie, intermediate teacher consultant for GEDSB, who came to our school and gave us much insight into the attitudes of females towards math and science; he also left us some invaluable resources to read.

We created a mathematics questionnaire for all students in grades 6, 7 and 8, and it was administered in the single-gender TAG groups.

I searched the internet for articles pertaining to our action research topic and found an excellent article at http://camel.math.ca/Women/BOOK/Gutbezah.txt, titled "How Negative Expectancies and Attitudes Undermine Females' Math Confidence and Performance: A Review of the Literature", by Jennifer Gutbezahl.

I read one of the books left by Bob Ogilvie, "How to Encourage Girls in Math and Science: Strategies for Parents and Educators", by Skolnick, Langbort and Day. It contained eye-opening information and data about how boys and girls are raised and treated differently over time. I summarized the ideas and shared them with Liana and other staff members.

Math questionnaire: observations based on the data

As planned, TAG groups became single gender and my group was all-female. From the outset it was obvious to me that the girls in my TAG group were relieved to be able to discuss their feelings about math in an all-girl setting. When asked why, they told me that the boys always monopolize the discussions and lessons in regular classes. Did I allow this to happen in my classroom? That was something I was going to have to pay very close attention to in the future. Despite some initial discussion about whether or not they liked math, we agreed to leave all discussion until after the questionnaire had been completed.

The questionnaires (see Appendix 1) were filled in during the next TAG class and students were asked to be as honest as possible. Liana and I decided that I would look at and tabulate the results from the girls' questionnaires and she would look at those of the boys. When examining the girls' questionnaires, I did not see as much negative attitude as I expected (based on the 33% figure on the attitudes section of the EQAO testing) but, nevertheless, the girls were definitely honest about why math is not their favourite subject.

When I looked at attitudes towards specific strands or math activities (see Appendix 2), I began to see some interesting patterns emerging - 38% of the grade six girls chose graphing as their favourite math activity and most gave the reason that it was easy to do and fun to colour. They feel creative when they are graphing. Least favourite was word problems (42%) and then math journals (33%). Not liking math journals surprised Liana and me because so many of the girls in our classes love to write and, when asked to write math journals, they write paragraph after paragraph in response to the journal topic. Their reasons for not liking math journals included not liking to explain themselves, and finding it too difficult to explain something mathematical. It was encouraging to see that 73% of the grade six girls do not worry about the reaction of boys when giving answers in class, leaving 27% who do worry. That number increases to 43% in grade seven. As for whom they prefer to work with when doing math, 40% in grade six prefer being paired with a girl, and 38% prefer working in a group of all girls. By grade eight, girls prefer to work alone (40%) or with one other girl (40%).

Eye-opening figures were seen in the responses to the questions, "Do you like math?", and "Are you good at math?" While 67% of the girls in grade six like math, that number is reduced to only 57% in grade eight. When asked if they are good at math, 73% of grade six girls said yes, but only 43% of grade eight girls feel they are successful with the subject. (See Appendix 3)

When I added the data about the boys to the comparison chart it was interesting to see the differences between the genders. Unlike the girls, 29% of the boys chose problem solving as their favourite math activity. They, too, like graphing (also 29%). Math journals were chosen to be the least favourite math activity in all three grades (25% in grade six, 62% in grade seven,

and 55% in grade eight). Their resounding reason was an immense dislike to explaining something in detail.

In contrast to the girls, 100% of the boys in grades six and seven are never concerned about the responding orally to math questions in the presence of girls. That number drops to 92% in grade eight. When asked if they like math, the number increases from 71% in grade six to 90% in grade eight. 86% of the boys in grade six feel they are good at math and 91% in grade eight believe the same.

To provide us with some corrective feedback from the students, we had included the question, "What would make math more enjoyable for you?" on the questionnaire, and their varied responses (see Appendices 4 and 5) gave us food for thought about our own teaching practices in the classroom.

The data was shared with the staff, and then with the TAG groups. The girls in my group did not seem surprised with the differences but most agreed that, if given the opportunity, they would like to take a more active role in math lessons.

Rethinking the action research focus question:

As time passed, my action research question became more focused, and was thus re-written:

> *What is the stimulus to foster positive attitude for girls towards the importance of math and science in their lives?*

Liana and I discussed how males could be a part of our question and we created this:

> *What can a teacher do to make the classroom less gender biased during math/science lessons so that both boys and girls feel comfortable and challenged with lessons, assignments and the curriculum?*

Modifying my practice in the classroom: corrective feedback practices

I now felt better prepared to tackle the action research questions at hand, and was beginning to be more aware of gender attitude differences in my classroom. Of note was an interesting observation I made when marking sentences written by my students. The word was *genius* and students had been asked to put the word in a sentence. Six girls in the class wrote similar sentences: "He's a real genius when it comes to tests (or school work)". Only one girl referred to the genius as a female. The boys' sentences were more generic, such as "You'd have to be a genius to figure out how to do that!" I struggled with whether to make this a class discussion or not and finally decided that while some insightful comments might be made during such a discussion, some hurtful or damaging ones might also be made, so I decided to leave it alone, for the time being.

Promoting a change in attitude had to come from me, so I made it a point to randomly bring in

and discuss, with the students, articles about talented females in the news (sports, space travel, scientists, etc.), women who were breaking stereotypes. Soon several female students were bringing in related newspaper and internet articles, and appeared to look forward to boasting about "one of their own".

I was thrilled when five students, of both genders, brought in an advertisement insert that had been placed in the weekend newspaper promoting a computer for girls (covered with Barbie decals) and a computer for boys (covered with Hot Wheels decals). They were incensed to think that adults were attempting to stereotype them. Further discussion developed a few days later when several students brought me an article about trading cards for girls based on photographs and information about "Real Boys". They were outright insulted to think that this was being touted as the female equivalent of boys' Pokemon cards.

Concrete proof of a slowly developing change in the attitudes of the girls in my class came about when speech topics were being chosen in January. I was thrilled to learn that more than half of the girls in my class were researching famous Canadian females such as Julie Payette, Laura Secord, Pauline Johnson, and Becky Kellar, and two boys were researching Roberta Bondar! On the advice of the articles and books I had read of late, I changed my seating plan to allow girls to sit next to girls of their choice. The research says that girls fare better, academically, when they work exclusively with girls, and for this reason all group work in my classroom was now single gender. The girls loved this change because in the past I had always insisted that there be a mix in each group, using the reasoning that the stronger ones would assist the weaker students. I had also believed that the more-focused females would positively affect the inattentive males. With the single gender groups I saw the girls gain confidence daily as they helped each other, asked questions, and worked collaboratively on all aspects of the curriculum.

Problem solving was determined to be the least favourite aspect of the math program for girls according to the math questionnaire, and yet it is woven throughout the math curriculum, so I decided that if I were to choose one area upon which to focus in math, problem solving would be it. Amid groans from the girls and the boys, we began an intensive unit in January in which problem solving strategies were explored and used repeatedly with word problems. Day after day, we worked on problem solving in single gender groups and after two weeks I began to notice a change in the students' attitudes and approach to the work. They began to use the terminology , "Let's use guess and check for this one", "Yeah but if we create a t-table we might see a pattern emerge") and appeared to be less frustrated with the questions. My weaker girls were speaking excitedly about the problems. It was working! When our unit was over, the students asked if we could devote one day in each six-day cycle to problem solving, and now they eagerly anticipate the word problems awaiting them. That is quite a refreshing change from the fall. Back then, I had erroneously assumed that the students arrived in grade six knowing how to solve problems. Because they lacked the basic steps, they had been frustrated and lacked the knowledge to approach problem solving with confidence. Now, half a year later, they have both the know-how and the desire to problem solve. The girls, primarily, demonstrate the confidence to solve word problems without much teacher intervention or guidance.

How else has improvement been demonstrated?

After the second term report cards were distributed I was curious about how much, if any, the girls in my class had improved in mathematics from the first term. I was pleased with the results *(see Appendix 6).* As a frame of reference, I also looked at last year's grade six students and their changes from term one to term two. Then, I calculated the number of girls who had achieved level 3 in each of the strands as compared to last year's girls in second term *(see Appendix 7).*

Return to mixed gender groupings nets positive results:

With the students working in single gender groups since the beginning of the second term, I have seen girls who were reserved and hesitant to contribute to class discussions become more confident and willing to share ideas with their peers. In February, during social studies, we were reviewing the unit "Natives of Canada" in preparation for a test. We were playing a game of Jeopardy and I placed the students in mixed gender groups so that I could see if any change in the group dynamics had taken place since the start of the action research. I was pleasantly surprised - in the fall the boys usually overtook the groups and did most of the talking. Now, in February, the reverse was seen. Girls who I had known to sit back and just watch the group's proceedings were now the leaders of the group - the girls were deciding who would answer the questions, how to organize the information during the game, etc. It was truly amazing to see these girls exude confidence with their peers! Working in single gender groups had certainly helped the girls in my class.

Action research conference:

Liana and I were asked to present our findings thus far to a small group of interested educators at the annual Action Research Conference in Brantford. In preparation for our presentation, Liana and I came to realize that definite positive changes were taking place in our classrooms. With this knowledge, we presented our action research to an enthusiastic group who freely offered their opinions and experiences with others in the group. Realizing we learn best from others, Liana and I asked conference participants to provide written input and experiences in relation to our action research topic and were pleased with the sharing going on in the room. (See Appendix 8)

Next steps

As May approaches I realize that, in some respects, I have made strides in ensuring that the girls in my classroom experience increased confidence and self-esteem when doing math, and other subjects. I just have to look at the feelings of self-worth displayed daily by several of my female students to know that I have achieved some success in this area. On the other hand, I also realize that my action research is far from over as I will continue, on a regular basis, to seek and implement ways to foster positive attitude for girls towards the importance of math and science in their lives. Some next steps that are on the go right now are as follows:

- Liana and I have arranged for Bob Ogilvie to come to Lynndale Heights on May 15 to in-service the staff about gender issues in the classroom.

- Liana and I are planning a "Teen Esteem Lunch" series for the fall of 2000 in which female role models from the community will spend lunch hours with the females in grades 6, 7, and 8. Several contacts have already been made and the idea is being well-received by the staff at Lynndale.

- A program called GIRLS (Growth, Independence, Respect, Leadership, and Self-Esteem) Power Camp, which takes place each spring at Waterford's Camp Trillium, was recently brought to my attention by my new administrator. He has passed my name on to the person in charge of the camp and Liana and I hope to enroll several of our grade eight students for the 2001 camp.

Changes will continue to take place in my classroom as I seek and read more literature related to my action research topic. Ideas and changes will be implemented in my daily interaction with my own students and those in other classes in my school. Being a part of this action research project has shown me that the feedback-feedforward philosophy has enabled me to pinpoint an area requiring closer attention and then provided me with the tools to foster improvement and change in my students and in my teaching practices.

APPENDICES

RESULTS OF MATH QUESTIONNAIRE
(GRADES 6, 7, AND 8 STUDENTS)

		GRADE 6		GRADE 7		GRADE 8	
QUESTION	POSSIBLE ANSWERS	GIRLS	BOYS	GIRLS	BOYS	GIRLS	BOYS
Which of the following experiences in math is your favourite?	using manipulatives	7 %		6 %			8 %
	math journals	7 %			8 %		
	measuring and estimating	15 %	14 %	6 %			8 %
	word problems		29 %	6 %	15 %		25 %
	solving algebraic equations			6 %	8 %	22 %	8 %
	slides, flips, and turns		14 %			17 %	17 %
	pencil and paper tasks			9 %			25 %
	constructing angles	7 %			8 %	22 %	8 %
	describing patterns				8 %		
	graphing	38 %	29 %	50 %	23 %	39 %	
	creating and using nets			14 %			
	probability games	23 %	14 %	9 %	31 %		
Which of the following Which of the following experiences in math is your least favourite?	using manipulatives					7 %	
	math journals	33 %	25 %	24 %	62 %	27 %	55 %
	measuring and estimating	8 %		5 %			
	word problems	42 %	25 %	24 %	23 %	33 %	9 %
	solving algebraic equations			5 %	8 %		9 %
	slides, flips, and turns	8 %	13 %	5 %		13 %	9 %
	pencil and paper tasks	8 %	13 %	19 %	8 %		9 %
	constructing angles			5 %			
	describing patterns		13 %	14 %		20 %	9 %
	graphing						
	creating and using nets		13 %				
	probability games						

		GRADE 6		GRADE 7		GRADE 8	
Are you concerned about the reaction of members of the opposite sex when you give answers in math class?	yes	GIRLS 27 %	BOYS	GIRLS 43 %	BOYS	GIRLS 21 %	BOYS 8 %
	no	73 %	100 %	57 %	100 %	79 %	92 %
Do you think your marks in math this term accurately reflect your ability to do the subject?	yes	83 %	43 %	72 %	46 %	71 %	55 %
	no	17 %	57 %	18 %	54 %	29 %	45 %
When completing math assignments, do you like to work:	alone	15 %	25 %	5 %	38 %	40 %	23 %
	in a group of all girls	38 %		10 %	8 %	13 %	
	paired with a girl	40 %		45 %		40 %	15 %
	in a group of all boys		13 %		15 %		
	paired with a boy		25 %		23 %		15 %
	in a group of boys and girls		36 %	40 %	15 %	7 %	54 %
If given a choice, would you prefer to attend a math class of:	all girls	64 %		38 %	8 %	29 %	9 %
	all boys		57 %				
	boys and girls	36 %	43 %	62 %	92 %	71 %	91 %
Do you like mathematics?	yes	67 %	71 %	55 %	67 %	57 %	90 %
	no	33 %	29 %	45 %	23 %	43 %	10 %
Are you good at math?	yes	73 %	86 %	59 %	67 %	43 %	91 %
	no	27 %	14 %	40 %	23 %	57 %	9 %

STUDENT IMPROVEMENT IN GRADE SIX FROM TERM ONE TO TERM TWO
--A comparison of two classes--

	1998-1999 Academic Improvement from term 1 to term 2		1999-2000 Academic Improvement from term 1 to term 2	
MATH STRAND	**Females**	**Males**	**Females**	**Males**
Number Sense	64%	38%	50%	35%
Measurement	7%	18%	67%	20%
Geometry	21%	27%	33%	20%
Patterning and Algebra	0%	27%	33%	30%
Data Management	29%	18%	33%	20%

I attribute single gender groups as the reason for the marked improvement in female academic achievement in math this year when compared to last year's results with my students.

More specific than appendix 6:

NUMBER OF FEMALES WHO ACHIEVED LEVEL 3 IN MATH IN THE SECOND TERM OF GRADE SIX

--A comparison of two classes--

	1998-1999 Term 2		1999-2000 Term 2	
MATH STRAND	**Achieved Level 3**	**Achieved Level 4**	**Achieved Level 3**	**Achieved Level 4**
Number Sense	78%	7%	67%	16%
Measurement	71%	0%	83%	0%
Geometry	71%	0%	83%	0%
Patterning and Algebra	86%	0%	83%	0%
Data Management	71%	0%	92%	0%

Data was gathered and calculated in April of 2000.

Improving Literacy
Through Improving Students'
Attitudes toward Reading

Marlene Dayman

Marlene Dayman
Grade 1 Teacher
Lansdowne-Costain School

Marlene Dayman is currently teaching grade One at Lansdowne-Costain School. She is using the knowledge she gained from her classroom research to help children achieve Language Expectations.

Focus

We began by examining past EQAO results, tests and anchor booklets. We made a list of what students would need to know and be able to do to reach a level three or four in their reading and writing. We then discussed how we could help students acquire these skills and what materials we might need to make this happen. Our individual action research projects were a direct result of this discussion.

Summary

Over the course of the 2 ½ months of this project, my split grade 1 and 2 focused on development of descriptive vocabulary, super sentences, quotations and sequence of ideas in a narrative, as well as beginnings and endings and what they needed to include. We did this through a variety of genres of writing all of which were meaningful to them and had a clear purpose in their minds: letters to pen pals, descriptive writing about something special to them and their favourite foods, non-fiction informational writing, narratives about an adventure they had had and a recount of a class trip to the butterfly conservatory in Kitchener.

Process

I used storytelling as an important part of the writing process because I believe it to be a key ingredient to story-writing. I modeled the telling; they told their stories to a partner or to the whole class, and they used various forms of puppetry to retell familiar stories which we videotaped. This definitely helped to clarify the components of stories in their minds.

Next, I used the interactive writing process to model good beginnings and endings, punctuation, spelling rules, grammar and sentence structures in a problem-solving atmosphere. Then we began to revise our co-operative writing to substitute more descriptive verbs and add adjectives and adverbs. We combined sentences in interesting ways to provide variety. They all agreed that the result made a more interesting story. This was repeated in a variety of formats.

The literacy consultant introduced us to a more in-depth approach to story-writing through a story about an old man whom they created, described using a web of descriptive vocabulary and eventually drew in detail during an art lesson. They wrote a paragraph to begin the story, introducing this character. This was repeated with the setting (a house) in a second paragraph. A problem was dictated: He lost something. They created a quotation in which the lost item was made known. Then they spent several days searching for it in different locations until he finally found it. This produced a much longer, more descriptive piece of writing over several days which we produced into a shape book of many pages. Their enthusiasm was evident.

Finally we self-edited, peer edited, revised and published our writings. I evaluated several of them using the rubric in the Writing Exemplar and tabulated the results in the different skill areas in the form of a coloured bar graph. I repeated this at the end of the project to determine growth. Copies of these rubrics were sent home to parents along with an explanatory letter and the actual piece of writing which they were to share in a positive way.

Results

While results varied with the degree of interest in the writing projects, I noticed a dramatic improvement over time in the use of descriptive vocabulary, use of quotations, improvement and consistent use of better beginnings and endings and in the overall length and quality in their writing depending upon the ease with which they could put their thoughts onto paper. Those who still struggled with each word, were less ready to make the changes on paper, although they did so orally.

Their creation of a story planner is still evolving and their total understanding of its purpose with relation to the story is not entirely clear to all. But given the limited time span of the project, I felt that they had shown dramatic improvement overall in many areas. This learning is part of a larger process which will require many more repetitions over a longer period of time for complete understanding.

Many of the children are now writing from their hearts with a real voice, rather than just listing events in the "and then" fashion. I find that writing with a real purpose is absolutely essential to reach this step and is the reason that I personally abhor daily journal writing. While it has its place, I find that at this stage it does little to improve the quality of writing.

Conclusions

What have I learned from doing this project? I have reaffirmed my feelings that storytelling is an important part of the story-writing process which is often ignored or underused. Writing of a good story will involve many days due to the short attention span of children at this age and the amount of energy and thought it takes to put words onto a page. I have a better grasp of the role of peer editing although I need to fine tune this skill even more. I will definitely do more modeled interactive story writing even before the children are able to write their own stories of any length. I will continue to create situations which give the children a need to write for this is always the best motivator and produces the best stories with lots of feeling. Editing continues to be an issue with a class of this size because I feel that they learn more when I can edit with them personally. I have developed new skills which help them move past their spelling limitations to write from their hearts. Using the writing exemplar has helped me better evaluate their writing style, organization of ideas and sentence structure above and beyond the conventions which we spend so much time with in the early grades. Having them read it first to separate it from the print errors is very helpful in hearing their "voice" and their message.

While many of these skills, I was just ready to teach anyway, the action research project helped me to utilize tools at my fingertips in a more intensive way, i.e. First Steps Writing, All Star Writing, the Writing Exemplar, the literacy consultant. Consequently, I was able to focus on and assess many attributes in a short period of time. It was exciting to see their growth of skills and development of their love of writing and to be able to share this with their parents in a very concrete way.

Marlene Dayman, GEDSB, 2001
PC Concepts 10/01

"Problem of the Week"

An Approach to Improving Students' Reasoning Skills in Mathematics

Joanna Finch

Joanna Finch
Grade 6 Teacher
Banbury Heights

SUMMARY

Joanna spent the first eight years as a primary and intermediate teacher. She left teaching for three years to raise her family and returned part-time to the position of teacher-librarian. As a teacher-librarian she found the work rewarding working with smaller groups of children but she felt she had lost the personal connection that occurred in the daily interaction with a constant group of students. When the opportunity presented itself she returned full time to a grade 6 classroom at Banbury Heights Elementary School in Brantford. She embarked on this action research project in an attempt to make a difference in her student's achievement.

1. **Focus:**

   How am I going to be able to help my students better communicate their problem solving ideas?

2. **Process:**

   2.1 Rationale:
   - Need to improve EQAO provincial test results
   - Need to assist students in communicating reasoning and communication skills in problem solving.

   2.2 Steps:
   - Developed "Problem of the Week"
   - Used scaffolding, corrective feedback and small group conferencing to self-assess.
   - Used journal writing for corrective feedback and reflection.
   - Developed Pythagoras Math Club.

3. **Findings:**

1. Corrective feedback helped students to identify strengths and weaknesses in problem solving.
2. Conferencing helped students develop reasoning skills.
3. Fifteen of twenty-three students were confident enough to join the extracurricular math club
4. Twenty-one of twenty-three students believe they are better problem solvers than they were at the beginning of the year.
5. Having a critical friend and extra eyes in the classroom helped the teacher document what was happening in the classroom.

PROJECT

"On my first try I wasn't thinking... Eureka! I've done it."

- a written comment by Jesse, a grade 6 student, included with his Problem of the Week solution, February 26th/2001.

The pride and confidence embedded in Jesse's statement reflects his important sense of personal achievement at being able to reason through a problem, to recognize his initial mistake and to correct it in order to effect a joyously successful solution. As I responded to his efforts with comments in his workbook, his words brought a smile to my face. When I subsequently told him this, my words brought a smile to his face.

This is what teaching is all about.

A Personal Impetus for Action Research

At the beginning of the project I thought that I needed to have a clear understanding of where I was going and how I would get there. I discovered, however, that my ideas developed and unfolded over the course of the year rather than crystallized at the beginning. Just as my students need the opportunity to discuss their ideas with each other, it was critical for me to have the opportunity to talk with Susan, my in-school partner on EQAO results, and with our mentor, Diane. I discovered that I best learn about what I do and how I do it by articulating these things to others. Diane visited my classroom on a couple of occasions to observe "from afar" the processes that the students were applying. Through our subsequent discussions and through impromptu conversations with Susan I realized that although I instinctively evaluate and re-evaluate my pedagogical convictions, it is through the sharing of ideas that I clarify and enrich my own thoughts and beliefs.

Why did I become involved in action research? My initial response is because my principal, Janice, asked if I would be interested, and because of the respect I have for her, I knew that whatever she asked me to do would be of value to my students and to me. The 1999 - 2000 EQAO Provincial Testing results from our school had been poor, and as I was new to Grade 6, I would have a vested interest in addressing the situation.

The source of a more complex answer, however, had been developing over a number of years, working like a grain of sand to produce irritation. As I reflected on where I had come from and where I was heading, it was disturbing to feel that I was

journeying into and reluctantly confronting my own professional "Heart of Darkness".

The first eight years of my career had been spent as a classroom teacher in the primary and intermediate divisions. For a variety of reasons, I used to feel that I was a good teacher - that I had a passion that made a difference in the lives of at least some of my students. I then left teaching for three years to raise my family and subsequently returned to the profession part-time as a teacher-librarian. The opportunity to work with smaller groups of children was rewarding, but I had lost the personal connection that occurs as the result of daily interaction with a constant group of students.

This loss became particularly salient during my final three years as a teacher-librarian. I had the opportunity to work closely with a young, skilled and extremely enthusiastic teacher who made a difference in her students' lives by using the curriculum as one means of listening to them as people first, students second. One of the curriculum springboards that Sandra used was a "Problem of the Week" which her students were required to solve and write up independently. It was a vehicle to challenge problem-solving skills and provide an opportunity for written and oral communication between teacher and student.

In spite of close student contact through involvement with extracurricular activities, I continued to feel plagued by the loss of what I had been in the classroom. When the opportunity to return to that environment presented itself, I was quite happy to do so. Although I wasn't aware of it at the time, I have come to realize that my feelings of ineffectiveness with students were eroding my own sense of worth and self-confidence.

How are my students ever going to be able to do this when a number of them have trouble with how to begin relatively simple one and two step problems?"

The Evolution of a Research Question

As previously stated, our Grade 6 Provincial Testing scores were low in comparison with results from other schools in our Board and in the province. The following table indicates the percentage of students at the four levels of achievement in the four categories of Mathematics:

Knowledge/Skills Category	Level 1	Level 2	Level 3	Level 4
Problem Solving - analyses and uses appropriate strategies that lead to accurate solutions	33	43	8	0
Understanding of Concepts - uses and explains required concepts and incorporates mathematical ideas	27	52	10	2
Application of Mathematical Procedures – selects and applies correct procedures and operations	30	43	20	0
Communication of Required Knowledge – uses clear explanations with precise justifications	37	45	7	0

Clearly, "Problem Solving" and "Communication of Required Knowledge" were weak areas. Although my Grade 6 students are not the Grade 6 students who produced the results, I had, by October, determined that problem solving was definitely an area of difficulty for them. In my October 12th journal entry I wrote:

"My own students are weak in problem solving so the direction I'd like to take is establishing steps for improvement in this area. I'm in a bit of a quandary because I know that the Grade 6 testing involves multi-step reasoning, which incorporates broadly based strategies.

In communicating their solutions, students are expected to tell what they know, outline a strategy, then solve the problem using words, numbers, and pictures.

My Initial Attempt to Formulate a Research Question

Given the following practices that I was carrying out in the classroom, I formulated my research question as, ***"How am I going to help my students better communicate their problem solving ideas?"*** The question pointed me, and therefore my students, in a direction which would be adjusted over time, based on our experiences.

The Actual Classroom Procedures

Every Monday morning I posted a "Problem of the Week" on chart paper with the various information parts colour coded for easy differential reading. During October and November, the process was very teacher directed, as I wanted to give the students a format for constructing their solutions in an organized and logical manner. Based on my above concerns it seemed sensible to provide them with a framework upon which to base their communication. The students were taught to outline four main steps in their write-ups:

1. **What I Know** – in this section they needed to put in point form, the information they would actually use from the problem in order to solve it.

2. **What I Need to Find Out** - this section was important to determine their understanding of what specifically was being asked.

3. **Strategy** - this section was where they identified, in words, the strategy chosen to solve the problem and then went about applying the mechanics to do so.

4. **Explanation** – this was the critical section where the students had to let me know what their thought processes were as they worked their way through the problem. I emphasized that they were to assume the reader knew nothing, and therefore detail and specificity of reasons for what they had done using language connected with the problem, were essential.

In order to obtain a Level 3 or 4 on the EQAO testing, a student needs to be able to sequence the above steps independently. With this in mind, we as a whole class, went through the following process for several weeks in October and November:

a) read cooperatively through the problem, discussing the important information and what the question was asking
b) name the strategy we would follow, record the strategy on posted chart paper and in the back of the students' notebooks, discuss and record the appropriate steps on the blackboard
c) erase the blackboard information, then independently work on the problem write-up

Through October and November I found that I was struggling with trying to balance the nitty-gritty of proficiency in mechanical skills such as long division and protractor use with the needed emphasis on reasoning skills.

One single "Problem of the Week" was taking about twenty-five per cent of the weekly time allotment for Math and I was not sure that this amount of time was actually accomplishing significantly worthwhile results. The students were, however, making some progress, in that by mid-November, the majority could select only relevant information for the "What I Know" section and could transform the problem question into an "I Need to Find Out" statement form. The latter was a particularly important step forward because it was not simply an exercise in semantics - the student had to personalize the question and refer back to this statement in the explanation part of his write-up. It served as a clear indicator that the student understood what the question was asking.

"I only wrote down the things that were important" *Desiree, as part of her "What I Know" section*

"To find out how many different ways Tanya could get a score of 4, I used an organized list." *Melanie, as the beginning of her explanation.*

As part of the explanatory section, I had been encouraging the students to do two things in order to stimulate those students ready to move from a Level 3 to a Level 4 answer:

1. to reflect on the degree of difficulty the problem posed for them
2. to encourage them to expand upon the particular problem by comparing it to a previous one or by extending it to a similar one they might wonder about.

One student, Danielle, made an exciting breakthrough by writing,

"I wonder what would happen if Jamie and John got to roll the die 4 times and the number had to add up to 14?"

My reply to Danielle was,

"Your 'I wonder what ...' statement is a Level 4 - it shows you are able to project and extend your thinking beyond the given problem. Wow! Try your suggestion as homework or in spare time and I'll take a look at it."

Danielle did exactly this - setting up an entirely new, more complicated problem patterned after the current one, complete with our usual format for the solution write-up. I was able to share both of her examples on an overhead with the rest of the class - a confidence booster for Danielle and a concrete goal for the others. We were ready to move ahead.

Once the class had an example of a peer detailing each step of her solution and extending her ideas, I noticed a general improvement in the explanatory section of most students' work. As Jason verbally reflected on one of his explanations, he commented,

"I now know what an organized list means - to work through all the combinations of one group of numbers before moving on to the next. I can't just say I used an organized list. I have to explain <u>how</u> I organized it."

A continuous loop of reasoning - explaining was beginning to take form.

The Adjustment of My Research Question

The "organized list" problem was one of the times that Diane visited my classroom. Some of the students expressed concern to her that they had missed some number combinations within a set of numbers, and wondered if it would be O.K. to add them at the end of the list, even though that meant the list would not be perfectly organized. This self-recognition of a difficulty was significant for both the students and myself: for them, it meant that they could specifically identify where their problem lie - the first step of reasoning; for me, it resulted in an adjustment of my question to,

"How am I going to assist my students to improve their reasoning skills?"

I believed that I needed to shift my research/teaching focus from that of communication to reasoning so the students would have a secure framework of thought processes in place before communicating about them. If they couldn't reason through a problem, recognizing their own difficulties, how could they communicate about it?

In early December, Dr. Jack Whitehead, discussed with the entire action research group, the concepts of "scaffolding", the gradual withdrawal of teacher direction in developing autonomous learners, and "corrective feedback", the ongoing, specific and constructive information given to students. The result of this session for me was twofold:

Firstly, it reassured me that the hours I was spending writing to the students in response to their problem solutions was worthwhile even if just one student moved to a higher level of reasoning ability. Evidence of this happening began to appear in the new year. Kristen demonstrated the ability to build on previous knowledge and experience in order to solve a problem by writing:

"I didn't enjoy this problem because you had to do all sorts of little problems."

I wrote back, **"Oh well, win some - lose some! Do you think that doing all the 'little problems' helped you to get the answer? Explain."**

Kristen's response was,

"Yes I think the little problems did help me because it leads to the main problem."

Kristen was able to recognize that the steps she applied in her reasoning process, however painful for her were integral to her eventual success.

Secondly, the session and subsequent conversation with Diane helped me to precisely formulate and articulate my next steps in the scaffolding process. I systematically removed layers of support in the following manner:

Step 1:

In January I lessened the whole group aspect of the process by forming small, teacher-chosen mixed-ability groups. Although we read through the problem together and I still posed the guiding questions, the discussion was done in groups of three or four. This put more responsibility on the individual to make reasoned contributions to the group. Each student did his own write-up as the group talked.

Step 2:

After my guiding questions and the group discussion, the students independently completed their own write-up rather than do it with the group as the discussion occurred.

Step 3:
The students formed self-chosen groups, appointed a leader to read the guiding questions, worked through the problem by applying a *familiar* strategy, then independently completed the write-up.

Step 4:
The students formed self-chosen groups, appointed a leader (different from the previous week) to read the guiding questions, worked through the problem by applying an *unfamiliar* strategy, then independently completed the write-up.

Step 5:
We dropped the group formation to work independently to apply a familiar strategy, with the option of using written guiding questions. Discussion was allowed when the frustration level began to impede success.

Many of the students expressed through words and actions, their need to be able to conference with others in order to obtain new ideas and clarify their own. Karys summed it up by writing,

"Sometimes it helps if I'm in a group to get other peoples ideas and mine."

During our first attempt at an independent solution, Kristen exhibited a complete shutdown in attitude until she was able to talk with another student, Lacey. Together they forged ahead to arrive at a successful solution. The two girls were so engrossed in their own conversation that they didn't notice a discussion of the correct answer concomitantly occurring between two other students at their table.

Meanwhile, Meghan, also at the same table, was working independently until she suddenly paused, joined briefly in the discussion with Kristen and Lacey, then erased, re-worked and adjusted her solution independently. These differences in needs and approaches highlighted both the success at independence which the scaffolding process had encouraged and the need to continue to provide peer interaction opportunities for those not yet comfortable with complete independence.

One pleasant surprise, which occurred during Term Two, was my students' support for an extracurricular math club. Fifteen of my twenty-three students joined our Pythagoras Club, working in groups to solve problems. I was confident that this response reflected the attitudinal importance which the students attached to problem solving and also reflected their burgeoning self-confidence.

Based on their Term Two Self-Evaluation Sheets I know that twenty-one of my twenty-three students believe they are better problem solvers now than they were at the beginning of the year. The problem solving structure that they followed, their discussions with others and the corrective feedback mechanisms all served as tools to assist the students to develop their independent reasoning skills.

"The format of how I solve the problem is way better than last term. The format is what helps me to solve problems fast." *Greg*

"I like when I am having trouble I can go work with a friend." *Karys*

"Oh, now I get it. Now I know what to do next. Hey, I get this. I can do this!" *Courtney, in conversation with me, fists clenched, arms raised in victory with a grin from ear to ear.*

The Effects of the Action Research Project

On a professional level, I have experienced the benefits of closely examining the teaching practices that I apply. The scaffolding concept is one that I have expanded in a variety of forms into other subject areas. It has provided the impetus for me to clarify in my planning process, exactly how I am going to assist the students to become autonomous learners.

On a personal level, I know that I have helped at least some of my students develop their problem solving skills and their self-confidence. The type of verbal and written interaction required to do this has reinforced the feeling that I can make a difference. The action research focus has provided an opportunity to critically examine and know, through the collection of data via conversations and written responses, that what I do does affect my students in a positive way. This affirmation has helped to fill the void I was feeling, and hence, my own sense of worth and self-confidence has grown.

How closely we as teachers and students are intertwined!

Joanna Finch, GEDSB, May, 2001
PC Concepts 10/01

A Personal Inquiry into Improving Student Writing

Elaine Hamilton
Heather Knill-Griesser

Heather Knill-Griesser
Teacher Consultant-Primary Division
Teacher Resource Centre

Elaine Hamilton
Grade 3/4 Teacher
Graham Bell School

Heather Knill-Griesser is currently a Primary Curriculum Consultant. She is a Masters of Education Candidate at Brock University.

Elaine Hamilton, a Grade 2/3 Teacher at Graham Bell School, has a diploma in Early Childhood Education, a BA in Social Development and a Primary/Junior Bachelor of Education Degree and additional qualifications in Special Education.

This paper describes the authors' efforts to improve students' writing using available resources, parent involvement, and developmental assessment tools. Beginning from the 1998-99 Grade 3, EQAO provincial tests results in Writing, the authors identified a number of teaching strategies to implement. They also measured student learning using standardized testing procedures at the beginning and the end of the study. Elaine Hamilton describes her experience with the project and how it connects to her own personal journey. The authors the describe their success in improving student writing as measured by qualitative and quantitative data. Most students improved between ½ and three grade levels in various writing skills; students' confidence increased; and parents and consultants responded positively. The authors found their experience with action research to be positive and see a bright future for this kind of personal investigation of practice.

We can't give children rich lives, but we can give them the lens to appreciate the richness that is already there in their lives. (L. Calkins, 1991)

My action research project was inherited in my transition to a Grade 3/4 teaching position at Graham Bell School. Heather explained the Action Research project that she was implementing in her class and her inability to complete the project without access to the children in her new role as Primary Consultant. I agreed to assist Heather with completing the action research project. Then I questioned my sanity. "What had I done!" I trusted Heather's judgement and believed in our connections/relationship which had in many ways existed before Heather and I existed. Our grandmothers had been friends and we grew up together attending the same public schools. As kindred spirits, our professional relationships/values/beliefs were one.

The action research project began with a review of the 1998-99 Grade Three Provincial Assessment Results in Writing. Heather was concerned with the overall achievements of the students in writing. Only 14% of the students were performing at Levels 3 and 4; 22% of the girls were performing at Levels 3 and 4 compared to 6% of the boys. An interpretation of the results indicated that further work was required to have students perform at Level 3 in writing to meet the provincial expectations.

The current practice was reviewed and the following aspect of the practice as a research issue was identified. (J. McNiff, 1998) The question for the action research project became:

> *"How can I improve student writing using available resources, parent involvement, and developmental assessment tools?"*

Taking the Inquiry Forward

A critical look was taken of the writing process and the resources that were available in the classroom. New resources were purchased that included:

- visual aid materials (Word Wall);
- print resources including communicating skills texts, writing handbooks, personal dictionaries, and writing folders;
- home study writing journals;
- writing manipulatives (vocabulary and sentence building activities).

To establish a writing base line each student completed the following assessments:

- Morrison-McCall Spelling Scale;
- Brigance Comprehensive Inventory of Basic Skills in Sentences, Capitals, and Punctuation and Reading Comprehension;
- Slosson Oral Reading Test (S.O.R.T.).

The writing process was integrated across the curriculum using planning sheets, first draft, editing and revising, and the final draft stages of the writing process on a daily basis. Dialogue journaling occurred between the teacher and the students in Reading Response Journals. Research projects and genre studies included using planning frameworks from First Steps Writing. Students were introduced to the expansion of their vocabulary through the use of hands-on spelling and phonics activities. Students participated in a mentoring program with the kindergarten class assisting their "buddies" with reading, writing, and computer literacy. Peer and self evaluation were reinforced in the writing program. Parents were involved in the writing program by participating in a home study journal with their children. Videotaping of the classroom provided further data. See attached video clip.

I attended B.A.R.N. (Brant Action Research Network) for information and peer support. I took the First Steps Writing and Oral Language Workshops to supplement my writing program.

My Personal Journey

By accepting an Action Research Project which was implemented by someone else; I was working at two different levels. I instantly became involved in the inquiry and outcome process, while still trying to accept ownership for the question.

Action Research begins with values. As a self-reflective practitioner I need to be aware of the values which drive my life and work so that I can be clear about what I am doing and why I am doing it. Sometimes I need to spend time clarifying for myself the kinds of values and commitments I hold as a working person. (J. McNiff, 1998).

At a B.A.R.N. meeting where Jack Whitehead was in attendance, we were discussing our action research projects and Jack questioned how he or the group could assist us to move forward with our stories. I thought about this and where I was having difficulties. I could see growth in the children and make notations, but the most difficult area for me was reflecting on myself. I noted this and suddenly realized much of who I am is due to my upbringing and education; just as it is for my students. I agree with Susan Drake who states, "We teach who we are. A teacher's implicit values are very much part of the real lessons of the classroom" (Drake, 1997, p. 40).

As a child, education was valued in my family. I found spelling very difficult, although I don't remember this same difficulty with reading. I checked with my mother to see if my memory was correct. She provided verification. My mother had realized part of my spelling difficulties were due to my lack of phonetics. Attending elementary school in the early 1960s meant I was part of a group of students who were not taught phonics. My older sister (currently a teacher with the Brant Haldimand-Norfolk Catholic District School Board) taught me my phonics. I accepted the mentoring position and worked extensively with my younger brother (who had a mild speech delay), prior to his admittance to kindergarten. He attended a Head Start Program the summer before kindergarten, organized by the Board of Education, and I volunteered as the assistant teacher. Language, whether written or oral, was important.

My desire or need to educate moved me into a career in Early Childhood Education. While teaching preschool, my program encouraged written language through name and initial sound recognition of students' own names and their peers'. Children showing an interest in written language, were encouraged and supported. The joy and satisfaction in their accomplishments was often evident in the pleasure on their faces. Those who couldn't yet control a pencil to print their names enjoyed the experience by rolling snakes. "Let's make our snakes and then our names." Oh, the versatility of play dough. Their excitement in completing the task was celebrated by all of us. Written language does not always have to mean pencil and paper. Often as educators we have to be creative.

In my second career, I found myself working as an Educational Assistant with the Brant County Board of Education. I clearly and fondly remember two long term occasional positions. One was in a Junior behaviour class where many of the children had difficulties in language

(reading/writing). "Better to act out then let the rest of the class know you can't read." The teacher had instituted a reading program for her students and as language improved so in many ways did behaviour. The other was a deaf Junior Kindergarten class. Although the children had little or no hearing or speech their enthusiasm for language was contagious. Small fingers would continually fly and children with eager faces would quickly lead you to their reading centre to share a book. I came to the conclusion I needed to expand my own learning and decided at this time that university was a definite possibility. I earned my Bachelor of Arts through extension courses from Waterloo University and after attending York University full time, I earned my Bachelor of Education in 1996.

I quickly found myself as the Executive Director of Niwasa Head Start, an Aboriginal Head Start Program funded by Health Canada. As part of our mandate, we established a head start preschool program to prepare urban Aboriginal children for elementary school, while re-establishing ties and introducing them to their native culture and languages (Mohawk and Ojibway). I felt it was only right that I learn one of the languages and thus began my lessons in the Mohawk language. This experience enabled me to understand the struggles and challenges my students so often face and the joy one can experience in a small success. Nia:weh/Meegwetch Niwasa.

Fate was continuing to lead me. My first contract position was as Teacher-Librarian at Graham Bell and Victoria Schools. When the Grade 1/2 teacher told me of three of her students who were becoming bored with their language program because they excelled in this area, I asked her to send them to me each day I was at the school. We spent their language period together doing novel studies, creating our own books, and enthusiastically learning. Soon I had other groups.

In June 1999, I became surplus to the system, but my journey did not end. And that is what this had become, a journey of learning not just for the children but me too. In August I was offered a position in Courtland in a Mixed Exceptionalities class. Although my students were in Grades 5 to 8, academically they were kindergarten to Grade 5. I had an idea of where my focus had to lie: language, mathematics, and social skills with self esteem as a major hurdle. I spoke with Heather and implemented many of the ideas she was developing in her Grade 3/4 class. With our class focus, these areas became important to the students and they began to take pride in their accomplishments. Where we lacked resources, we became creative. Each student was encouraged at their own academic level. We sought out what was important to them and that was our starting point. M. was thirteen but still printed at an early Primary level. She wanted to cursive write her own name. "It's important when you're grown up; you have to know how to write your name." I remember her excitement and joy the day she independently wrote her name for the first time. We all celebrated and she began working harder on all her subjects. K. a Grade 8, read at a pre-primary level. We developed an individualized program for him with a focus on phonetics and rhyming families in reading and spelling. He soon began to challenge himself to excel in spelling dictation. "I'm going to get perfect this week!" Often he did.

Most of us are not very experienced at listening to ourselves. We listen to everyone else: to principals, supervisors, specialists,

students, professors, publishers, researchers, parents, critics, editors, reviewers, and friends ... but when it comes to listening to ourselves, we don't have the time or the faith. (L. Clakins, 1991)

I had finally taken the time to listen to and reflect on my own process. I realized much of what I had been doing in my life had been leading me to where I was today and this very question. "How can I improve student writing using available resources, parent involvement, and developmental assessment tools?" I had accepted ownership for the question and was now able to move on.

If we want to work in conditions that are alive and stimulating for us, we must take responsibility for establishing those conditions in our classrooms. For starters, this means that we must decide that we are not going to feel guilty about giving ourselves time to learn. (L. Calkins, 1991)

The Inquiry Process and Outcomes

In this section, I have integrated the research process and the findings using evidence drawn from my own research notes. Home study journals, which contained wonderful reflective journal entries by both parents and students, provided the opportunities for parents to communicate their values to their children. One parent wrote, "Mommy and Daddy's happiest memory of you as a baby was when you were born. We were the luckiest parents in the world and still are." Parents' appreciation of the home study journal program was validated when a parent commented, "I love the journal idea. I can't wait to see what he writes."

Manipulatives are not only part of the regular writing program but have become a choice during free time activities. Students have used problem solving strategies to create games using the manipulatives. They have become a favourite activity during indoor recesses.

Parents have commented on the progress they have noticed in their children. One parent commented "I am very impressed with the gains my son has made in writing. He is even writing stories all the time in his free time at home and then he reads them to me." Another parent commented about the quality of their child's writing and the neatness of his work.

The success of our writing program was validated when Cathy Theophilus, an educational assistant in our school came into our room to check on the progress of J. in writing.

I pulled out J's reading response journal. Cathy explained that last year J. struggled to write one sentence. I turned to yesterday's journal entry which was two pages (every line) in length. Cathy was amazed. Although J. needs to be reminded to put spacing between his words, phonics and beginning and ending sounds were used.

The children are beginning to develop greater confidence in their own abilities and are comfortable enough to make inquiries if they feel I have made an error or omission. During music we were compiling a list of wood wind instruments. I had forgotten a comma in our list. K. inquired whether there shouldn't be a comma. Writing skills are carrying over into other subjects. M. and L. noticed a spelling error on the board, one letter had been omitted. The children are becoming more aware of correct spelling and sources to use to verify spelling. B's spelling has greatly improved; he has begun including clarification if he is uncertain he has spelled a word correctly: "Sinamall

that's the movie theder" (cinema that's the movie theatre). Many are still using the Word Wall and then their individual Word Books, while some are beginning to use the classroom dictionaries and thesaurus. Prior to the Grade 3 provincial assessment we were reviewing sources to access correct spelling. C. made the suggestion they could use the reading passage to check the spelling of words they were uncertain of, rather than always referring to the dictionary.

During reading response, many of the children are beginning to reflect on what has been read. When a character in a story died,

S. reflected *"I wonder how she died?"*

While D. questioned, *"Why did Samantha have kittens?"*

T. is able to relate the story to her every day life: *"Old grandma died that's really sad when my niece died it was really sad to she was just a little baby girl named Emily just like Willie's sister her named is Emily to. Emily is just the best name in the world."*

During class discussions, reading response, and written assignments, the children are sharing their opinions more readily and supporting their opinions with evidence from their readings:

D. *"I like Alice, because she had enough courage to tell her parents what happened to Willie."*

T. *"I liked Willie because he standed up to his dad and he got a lot of reseked (respect)." "I liked the houl (whole) book because it relates to what could of happened and it teaches a lot of things like Willie. When he broke his leg that was a lesen (lesson) not to ride the work horse"*

E. *"I think that the book is called the Door In The Wall because Robin keeps leaning (learning) new things like making a harp and making a toy boat and learning to wright (write) and read."*

Ideally, both teachers and students should bring all their skills, wisdom and energy to the teaching-learning transaction. We should not relinquish our identities as teachers in order to give students ownership of their craft. ... We need not be afraid to teach, but we do need to think carefully about the kinds of teacher input which will be helpful to our students. (L. Calkins, 1986).

Peer and self editing have been very effective. The children have begun carefully reviewing their own work and then asking a peer's opinion. Students have begun offering to edit work for others rather than waiting to be asked. Careful monitoring of this process is, however, necessary as some of the students diligence and commitment to the task is a little over zealous, thereby, creating errors that did not previously exist. Students who are stronger in language skills have begun asking if they might work cooperatively during research activities with students who benefit from language support. They have begun to value the strengths in themselves and others to the benefit of everyone.

The Early Literacy consultant was assisting us with writing narratives. Some of the students were having difficulties understanding that they were not writing a retell. M. wanted to retell a Pokemon story. We were discussing why this was not possible. That story had already been written and he was to create a new story of his own. J."That would be plagiarism. Mrs. Knill-Griesser told us that. Although they may not always follow the conventions of writing they are retaining what they learn. During

the provincial Grade 3 assessment practice test the students were somewhat frustrated I was unable to provide the reading and writing support they were used to. This was also very difficult for me. We discussed this issue and I reinforced to them that all they were to do was their best, the same as they did each day at school. They knew how to use the resources available and that I had confidence in their abilities. During the assessment, they used the skills they had been taught and I heard comments such as, "We've done this before." "You give us harder work than this." "This is easy"

When writing becomes a personal project for children, teachers are freed from cajoling, pushing, pulling, and motivating. The teaching act changes. With a light touch we can guide and extend children's growth in writing. Also, our teaching becomes more personal and this makes all the difference in the world. (L. Calkins, 1986).

Writing has become more than just a part of the curriculum. The students are developing an awareness of the value of the written word and using it for their own purposes. We read a number of poems from Nickolas Knock and Garbage Delight by Dennis Lee, because the Carousel Players are doing a performance of Lee's works. Each student re-wrote a verse for "Alligator Pie." They were very proud of their work and have asked that I re-read the verses to them anonymously. At the end of the day B. shared a poem he had written, on his own, with me. He had attempted to create a rhyming poem, but did not feel he was finished. I asked him to share it with me again later. D. is experiencing a family separation. She has discussed her feelings with me and is working through her experience by writing. She wrote a letter to both her parents expressing her thoughts and feelings.

Dear Mrs. Hamilton

If you remember the note my mom wrote to say thank you for your concern. I wanted to tell you I don't cry every night anymore because he is coming for fathers day.

Our students will also catch the magic from each other - if we let them. This means that we must focus at least in part on the very best writers in the room, extending what they can do and celebrating their successes ...because success is contagious. (L. Calkins, 1986).

T. has begun writing a story of her own undertaking. She has coordinated with E. who will be doing the illustrations. This is an activity outside of our regular class activities. T. has also begun a story with K.. As we shared these stories with the class, I began to find more and more stories each day on my desk with little notes attached asking me to please read them to the class.

In June, we began reading "Harry Potter and the Sorcerer's Stone." All of the children are enjoying this book very much. K. (who often finds reading challenging) came to me during free time to ask if he could read some of Harry Potter. He sat down with the book and read silently. When the bell rang he returned the book and said "Good; now I know what happened in the Quidditch game." With improvement in writing skills, improvement has also been noted in reading skills.

The more we know a child, the better observers we become. ... this is why we need systems of evaluation. This is why we need to develop and keep records of growth. By noticing growth, we nurture it. (L Calkins, 1991).

It is important to determine what works best for each child. M. is very pleased with his

reading. When small group novel discussions are over,. M. will appear at my side and say, *"Can I read to you?"* We read at least a page each day. Both M. and I value these few moments as we are both aware of his improvement.

As a challenge for the students and a means to expanding their vocabulary, we began Building Big Words. Each word of the day contained ten to fourteen letters. They used their letters to spell as many words as possible, while always trying to discover the word that would use all the letters. M. would often ask me if I would save a big word he had discovered so he might spell it for the class. Each day I saw his self esteem grow. At the end of each week, I would ask the students to spell the four big words for that week. Half of the students would have all four words correct or only one error.

Formal Assessments

On the Grade 3 provincial assessment held in May a year earlier, the Summary of Attitudes showed 69% of the girls and 47% of the boys indicated they liked to write, while 56% of the girls and 29% of the boys felt they were good writers. In June, 13 months later, the students were asked to complete a Student Reading/Writing Attitude Inventory. This inventory indicated the following results for Grade 3 - 100% of the boys and girls like to write; 100 % of the boys felt they were good writers; 85.7% of the girls felt they were good writers; 75% of the Grade 4 boys liked to write; 100 % of the Grade 4 girls liked to write; 100% of the Grade 4 boys and girls felt they were good writers. Here was evidence of an improvement in attitudes.

Pre-tests and post-tests in September and June using the three assessment tools, showed improvement in all of the children tested. Student absences made it impossible to test all of the students.

Indicating Grade Level of Improvement

Assessment	% Tested	1/2 Grade	1 Grade	2 Grades	3 Grades	4 Grades	5 or more Grades
Morrison McCall Spelling	96	7	12	5		1	
Brigance Sentences	92	12	10	2			
Brigance Capitals	88	5	5	4	5	1	3
Brigance Reading Comprehension	96	1	6	9	8		1
S.O.R.T.	69	3	6	8	1		

Parents and student comments at the end of the year attested to their feelings of success:

> *"B's report is awesome. B. is listening to what is being taught and understanding the concepts enough to apply himself. Thank you in helping develop B's growth."*
>
> *"Very good report. I'm proud of my daughter."*
>
> *"Good Job Mrs. Hamilton, Thanks"*
>
> *"I worked very hard and I think I did very well."*
>
> *"Thank you for everything you taught me during the past year. I learned a lot and will miss you a lot."*
>
> *"Thank you for making school fun."*

Summary and Next Steps

Although the conception of this action research project was Heather's, it became our project and the Grade 3/4 class became our class. We both shared the last day with this class and rejoiced in their accomplishments as they moved on to Grades 4 and 5. We believe that we improved student writing using available resources, parental involvement, and developmental assessment tools. What lies ahead for Heather and me? We will each continue our journey as life long learners and our paths will continue to cross. Heather will continue as Primary Consultant and I know I will be calling on her in my position as Grade 2/3 teacher at Graham Bell School. Will there be future Action Research Projects? Most definitely. Was our project a success? Definitely, but was also, at times, very challenging. I feel I have developed a deeper understanding of who and why Elaine Hamilton is a teacher and that matters to me.

Bibliography

Calkins, L. McCormick. (1986). The art of teaching writing. Portsmouth: Heinemann Educational Books Inc.

Calkins, L. McCormick, & Harwayne, S. (1991). Living between the lines. Concorde: Irwin Publishing.

Drake, S. (1997). Confronting the learning outcome: We teach who we are. In T. Jennings (Ed.) Restructuring for integrative education, 39-51.

McNiff, J. (1998). Action Research for Professional Development. Mississauga: Ontario Public School Teachers Federation.

This article was first published in the ONTARIO ACTION RESEARCHER – V.4.1.1 - Papers – 2001, A personal inquiry into improving student writing.

Elaine Hamilton and Heather Knill-Griesser, GEDSB, 2001

PC Concepts 10/01

Improving Written Communication in Math (Grade 3/4)

Sharon Harrison and Nancy Davis

Sharon Harrison
Grade 3/4 Teacher
North Ward School

Nancy Davis
Grade 3/4 Teacher
North Ward School

Sharon Harrison teaches grade four at North Ward School in Paris.

Nancy Davis is currently teaching in Kuwait. Her last teaching assignment was grade 3 at North Ward School in Paris.

Abstract:
For our project we decided to pursue students' written communication in math as the results on last year's grade 3 test were weak in this area. Our concern was to improve student communication in this area. Our goal was to provide students with skills to explain their answers to problems in written form. We believed that modeling was important to student success. Previous test problems were given and feedback was shared using anchor booklets. The students were exposed to examples of Level 3 and 4 from anchor papers. Students were encouraged to draw pictures and use numbers and words to solve mathematical problems. The problem solving model was also shared. Group math journals were used to promote oral discussions and allowed students to see a variety of answers to given problems. The "Problem of the Week" allowed parents to become involved in the project and made them aware of the types of questions being asked and how they could help their child with math concepts

School Profile
North Ward Public School is located in Paris, a town of 8400 people in South Western Ontario. The school has a population of 500+ students. It is a JK – 8 school. There are five teachers working with grade 3/4 students. There is a grade 4/5, 4, 3/4, 3 and 2/3. Much grade collaboration occurs amongst staff to discuss unit plans and implementation. The majority of students have English as a first language.

Class Profile
This year, the Grade 3/4 class has 27 students and the Grade 3 class has 28 students. There are two identified students, one in each class. The straight Grade 4 has 26 students and is in the portable. The 2/3 has 26 students.

Resources Used
Quest 200 Text and Resources
Quest 200 (Grade 3) "Problem of the Week"
Collections (Grade 3) Ginn
Scholastic Spelling (Grade 3, 44)
Math Group Journals

Focus

"How can we improve written communication in math?"

For our project we decided to pursue students' written communication in math as the results on last year's grade 3 test were weak in this area. Our concern was to improve student communication in this area. Our goal was to provide students with skills to explain their answers to problems in written form. We believed that modeling was important to student success. Previous test problems were given and feedback was shared using anchor booklets. The students were exposed to examples of Level 3 and 4 from anchor papers. Students were encouraged to draw pictures and use numbers and words to solve mathematical problems. The problem solving model was also shared. Group math journals were used to promote oral discussions and allowed students to see a variety of answers to given problems. The "Problem of the Week" allowed parents to become involved in the project and made them aware of the types of questions being asked and how they could help their child with math concepts.

Results from 1998/99 Grade 3 Test

Forty-four students participated in the grade 3 test last year. 23% were receiving special education support. Following is data from the results:

Achievement Levels Mathematics

Overall Levels of Achievement

Level 4
5%

Level 3
45%

Level 2
43%

Level 1
7%

Understanding Concepts

Level 4
2%

Level 3
25%

Level 2
41%

Level 1
32%

Knowledge/Skills Categories

Problem-Solving

Level 4
0%

Level 3
25%

Level 2
36%

Level 1
39%

Application of Mathematical Procedures

Level 4
5%

Level 3
32%

Level 2
48%

Level 1
16%

Communication of Required Knowledge

Level 4
2%

Level 3
30%

Level 2
36%

Level 1
32%

The mathematics results had the greatest number of students achieving a level 1 or 2.

Possible Explanation:
We found it interesting that the overall level of achievement in mathematics was 50% at level 3 and 4 and the breakdown in the knowledge skills categories indicates that the majority of the students are at levels 1 and 2. This would indicate to us that the weakness lie in written responses, thus all of these math results will be negatively influenced by poor written communication.

From looking at the school results from last year's Grade 3 testing, there was an overall weakness in students' ability to communicate understanding in mathematics. Students are expected to do the following when solving a math problem: tell what they know, tell what they're going to do, then solve the problem using "words, numbers and pictures". They also are expected to clearly describe in writing their thinking and understanding of concepts using appropriate mathematical terminology and symbols. All or some of these expectations may be the cause of poor communication scores on the testing results.

In addition, we also had the following concerns about the EQAO's standardized testing: the test is based entirely on written responses (no oral communication is assessed by the test); some students have a general lack of interest in performing well on the tests; it is a high stress and artificial testing situation fro students, in that students ware no allowed to receive any assistance from the teacher or others, as they are normally accustomed to receiving; the marking evaluation is not clearly specified to the students, making them unsure of which sections of the test are more important than others.

Actions within our own classrooms:
In order to increase students' performance in communicating understanding, we did the following:

1. explicitly taught problem solving steps and strategies ("Problem of the Week")
2. used required math terminology regularly
3. gave students opportunities to communicate both in oral and written form (math journals)
4. used grade 3 test samples
5. modeled evaluation expectations/corrective feedback
6. involved parents

Teaching Problem Solving Steps and Strategies
Each week the students were given the "Problem of the Week" to work on over the weekend. Parents were encouraged to discuss the problem with their child and suggest possible strategies. Response from some parents indicated they had difficulty suggesting strategies. Mid-week we discussed the problem as a class and developed possible strategies. Through modeling, the students were taught the skills of communicating their answers through pictures, numbers and words. The strategies for solving problems such as: Guess and Check, Drawing a Picture, Using Tables/Charts, were introduced with the appropriate problems. See "Problem Solving Strategies" from EQAO (Teacher's Daily Plans).

Reflections
We found that when we first began working on the "Problem of the Week", students had difficulty showing their work and explaining how they arrived at their answer. Many sheets just had the answer. For example, only 7 out of 27 students completed their problem with a picture. After modeling answers over a four week period, 21 out of 27 completed the problem using pictures, numbers and words.

Now the class consistently solves problems using all three techniques. Also, in the beginning, parents were writing notes saying they had difficulty helping their children explain the answers. Now the notes no longer exist. Parents expect the "Problem of the Week" and have made comments such as, "Keep sending them, my child is getter better at thinking them through" and "I am learning how to rephrase questions such as describe and explain".

Use Math Terminology When Required

In order for students to communicate in math, they must be given the mathematical vocabulary. With the class we developed a math vocabulary dictionary. In groups the students brainstormed lists of words beginning with the letters of the alphabet. The charts were posted in the classroom for several weeks and the students developed their own dictionaries. Students were continually encouraged to use the terminology when explaining solutions to problems.

Reflections:

We found that the students were carrying the vocabulary over into other subject areas. For example, when participating in gymnastics they used the terms: "I just did a quarter turn". And "I did a half turn". In art, they recognized patterning symmetry. When discussing the patterns formed with arrays in multiplication, one special needs student observed, "They have the same numbers, they form a rectangle, but one rectangle has been rotated".

Give Students Opportunities to Communicate Both in Oral and Written Form (Math Journals)

Students were given the opportunity to explain math concepts orally. Most students are much more successful with this form of communication. The problems seem to occur when students had to explain their solutions in written form. With our consultant's help, the students were presented with the concept of group journaling. The whole class was presented with a simple problem and solutions were discussed and recorded on the blackboard. The class then came to a consensus as to what the correct answer would be. The students were then divided into groups of five. They gave themselves a group name such as 'The Problem Solvers' and 'The Marvelous Math Monkeys'. They were then presented with a problem similar to the one discussed before. They worked on solving the problem individually on their own worksheet. When they felt they had a correct solution they shared it with their group. If the group agreed, the solution was correct, they put it on chart paper to be shared with the whole class. The problems presented could be solved more than one way. Each group shared their solution with the class. Later, they were given the same question and were asked to explain their solutions independently in their math journal.

Reflections

Most groups were successful in working together to solve the problem. Some however, found that it was difficult to work with 'free riders'. It is important to have a good mix of students with different learning styles in each group. We decided that working in pairs might be better than working is groups as large as five students.

Some comments heard from the students:

"I like doing this. It makes math easier and I understand it better."

"Now I get it. When Alan said let's do a table, I could see the answer."

"Can we do math like this all the time?"

We had to stress to all group members the importance of accepting all ideas, even if they are wrong, because it showed their

thinking process. Putting down a wrong answer and stating it was wrong was also acceptable, as it too shows the child's thinking.

Use Grade 3 Test Samples

We wanted to alleviate the stress of the unknown and give the students the opportunity to experience the grade 3 test situation. Starting in January, we used test samples from previous years. We administered the test as it would be done in May. In late April, we administered last year's test exactly as it was given (except for the computer booklet component) over a five day period.

Reflections

The preliminary results were very disappointing. In math, the students left whole sections blank when they were tested in longer blocks (real test situations). They didn't apply the strategies taught to the situation. We wondered if their attention span was reflected in these results. When we used random samples that matched the topics of study, student results were significantly better. We took up the questions with the class and showed them level 3 and level 4 answers. The students were then given a chance to rewrite the tests. In April, the students' results were significantly better. Most students used pictures, numbers and words I their solutions. We took up the answers with the class. They demonstrated a greater understanding of what was required to reach a level 3 or level 4.

They were also interested in achieving a higher level. When we would tell a student their answer was a level 3, they wanted to know how they could get to level 4 and other students in the class were able to tell them how.

Model Evaluation Expectations/Corrective Feedback

In January, using overheads, we demonstrated level 3 and level 4 answers from anchor papers and exemplars. We focused on the use of pictures, numbers and words to solve the questions. The students were able to ask questions about level 3 and level 4 answers. They were given an opportunity to redo the questions and be re-evaluated.

Reflections

Students were interested in solutions given by examples. Some assumed that if they got the correct answer it was a level 3 or level 4. Comments made were: "You mean if I had added a picture I would have gotten a level 4") and "You mean there is more than one way to get the answer:" Some redid the questions, others are getting tired of hearing 'picture, number and words'.

Parent Involvement

Initial introduction to our focus of better communication in math was through the "Problem of the Week". Parent's reactions were indicated above. Practice tests were sent home so parents could get a better understanding of the types of questions asked. A meeting was help on April 18th to discuss the test and ways parents could help their child through it.

Next Steps

We realize the importance of modeling strategies and building in vocabulary starting as early as kindergarten. Children often come to the next grade with a personal word dictionary for writing. A thought for next year would be to send them on to the next grade with a math dictionary. Introducing problem solving strategies through "Problem of the Week" and group journaling as early as grade one would be beneficial. Using Quest 2000 in all of the primary grades would provide continuity to the students and they would be familiar with

the format of the program. Journal questions in the text are very useful in helping students with written communication.

Assessment and Evaluation

We plan to continue conferencing with students, rather than basing summative evaluation on quizzes, tests and daily work and drills. Conferencing gives us a clearer picture of where the child is and what needs to be done to help him or her further. Listening to students as they work with manipulatives helps with the understanding of their thought processes. Our records will show a more anecdotal approach to evaluation than grade marks. We also plan to continue modeling with the students. We modified our program to meet the needs of the students giving them a variety of methods to use when solving problems. The problems presented are relevant and meaningful to grade 3 students.

Conclusion

The results from last year's test that we administered in April, indicated that the students were developing a clearer understanding of how to approach a problem and solve it. We noted their answers clearly indicated improvement in their thinking. We feel we have prepared them to achieve to the best of their ability on the upcoming test.

Journal Entries:

Reduce/Reuse/Recycle Math
(sample assessment)

- a lot of difficulty with measurement
- money no problem
- not making connections
- took up test, discussed, modeled on overhead
- will give back to improve

Problem # 2 Assigned February 7

- limited answers
- not showing work, not drawing pictures
- parents having difficulty with some questions

April 26

- took up some math questions form last years' test
- children are giving awesome answers
- they now are telling each other what needs to be add to improve the answer
- we are all feeling good about this
- I guess some of it did finally sink in

(comparison of how I was feeling then and now!)

Question: What can we do at North Ward too improve written communication in math?

- group felt question was too broad
- how will we narrow it down?
- What do we need to look at?
- BE Specific!!!

Implement math puddle questions and journals

- observations: puddle question
- write step-by-step instructions on how to tell someone how to draw the pattern "telephone talk"
- involve parents
- some instructions explained explicitly
- photocopy these *
- many of the students avoided the task or would not improve when asked
- many avoid journal writing or are very vague in their responses

Do better in Reading Responses

- Began: 3Rs Method
- Retell/Relate/Reflect
- using in science, math and reading responses
- give it a few months so children get used to format
- Watch for Improvement!!!

Note:
- students appear to prefer computation work over work that requires planning, problem solving
- weaker students have more success in computation questions especially when given for homework
- parents more comfortable answering?

Problem of the Week
- having difficulty getting children to "show "their work
- Problem: cricket /toad on steps
- very few showed a picture; many incorrect answers
- did whole group: modeled answer
- many agreed it was easier to understand with a picture
- still had to threat with no recess to get students to redo problem with pictures
- how to motivate? Encourage?
- 7 out of 21 had picture
- just doesn't seem important

Today's Problem of the Week
- assigned right after problem above
- 11 out of 17 made a chart to help them solve the problem
- problem solved successfully
- students appeared to have a clearer understanding
- definitely easier to assess understanding more evident (more success when student describe orally rather than written)

Comparing 3-D Solids
- overall appropriate terms were used to describe shapes given
- more difficulty when comparing
- similarities easier than differences, i.e., square based pyramid vs. triangular pyramid
- few discussed shape of base independently
- needed reminders to look at shapes for differences
- good at using correct terminology, i.e., edges, vertices, faces
- compared number of faces, edges
- some need work

2-D shapes
- lots of difficulties remembering names
- discussing the number of sides, i.e., hexagon – more work needed to get students to show
- using pictures


2-D shapes

Example Question
- the total number of faces for a triangle and square is 24. How many triangles would you have? how many squares?
- need to start by showing a picture
- many hesitant to do this
- even with picture, hesitant to go further
- where are our risk-takers??
- RE-doing doesn't seem to be an option
- rewards seem to have to be extrinsic, not internal unfortunately
- few want a challenge

Number Patterns for multiplication
- starting to make connections
- Journal Question: What pattern is the easiest to count by?
- many gave time the number they thought he easiest, but difficulty expressing why
- some said it was because they had it memorized, e.g., count by 2's.

- no one noticed patter of odd or even, i.e. county by 3, start with odd number, even number, odd, even, etc.
- once introduced they began to notice more patterns in the numbers
- lots of "feeding" needed
- also encouragement to use proper terms when describing patterns

Note in Anchor Booklet
- pattern question with shells and small pebble
- level 4 student used words and pictures
- saw how rocks 3, 5 had 4 shells and rocks and rock 4 had 5 shells and rocks
- he/she also saw number pattern: 10 has rock, 20 both, 30 has rock 40 has both, 50 rock
- could see if pattern continues

Other Journal Entries
- use journal questions for all math strands
- Michele Landsberg – article worth reading
- * to read a variety of books for a variety of readers
- daily reading is * is there time??
- after reading article I'm making the time
- children need to read in order to develop their writing skills and creative thinking skills
- very important to solving problems
- more examples known will it improve their own thinking?
- didn't totally agree with "internet" comment
- students still need to "find" information by reading
- still have to comprehend and think out information given

Cubes to Communities, "Writing about experience"
Write about one important thing you learned.

Ryan, *"I learned to accept other people's ideas"*

Matt: *"One of the most important things was the volume. It's how tall and how many blocks it has."*

Teal: *"I learned my directions."*

Madeline: *"I leaned that when you make a map you have to do math too."*

APPENDICES:

#1 Problem of the Week – by Sammi

#2 Problem of the Week – by Kristen

#3 Problem of the Week – by Jesse

#4 EQAO Testing Comments

#5 Getting the wrong read on literacy –

Sammi

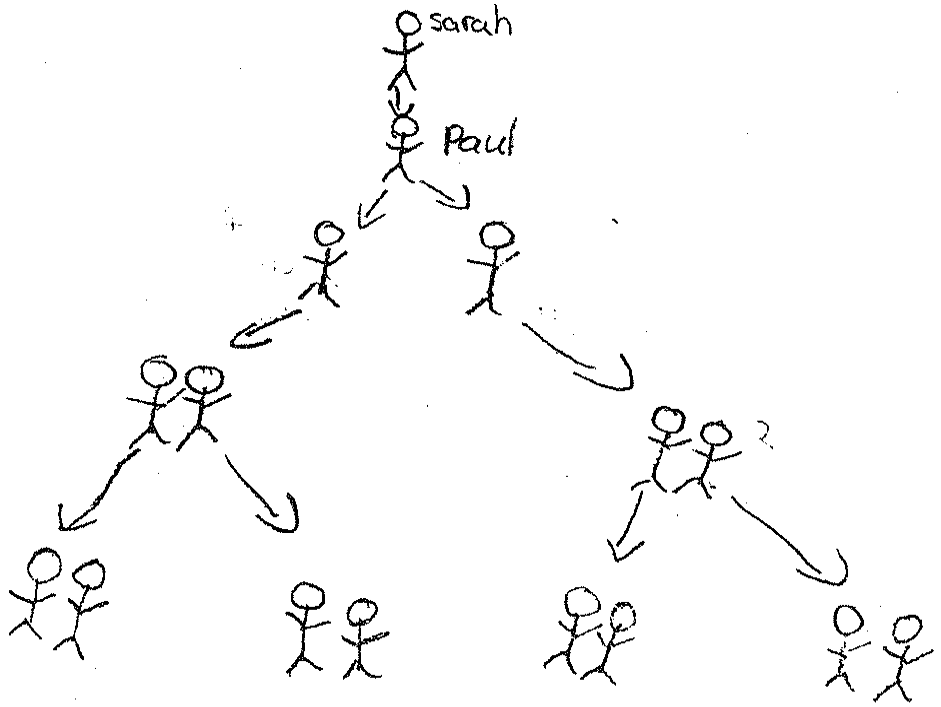
TUESDAY · WEDNESDAY · THURSDAY · FRIDAY · MONDAY

PROBLEM OF THE WEEK END

QUEST 2000

Secrets

Sarah had a secret. She told her friend Paul. He told 2 of his friends. Each of them told 2 friends. Those friends each told 2 friends. How many people knew Sarah's secret?



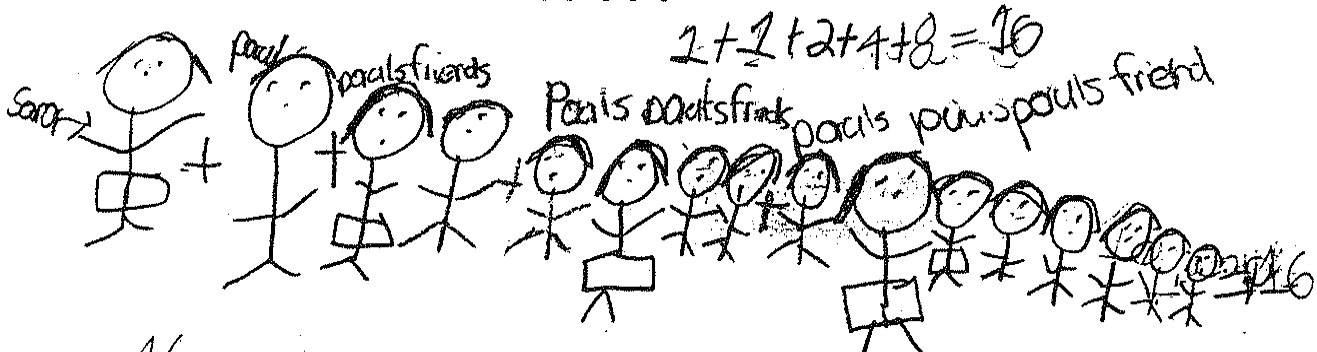
Altogeti
16 peo
knew t
secret

Well Don

PROBLEM OF THE WEEK

Secrets

Sarah had a secret. She told her friend Paul. He told 2 of his friends. Each of them told 2 friends. Those friends each told 2 friends. How many people knew Sarah's secret?



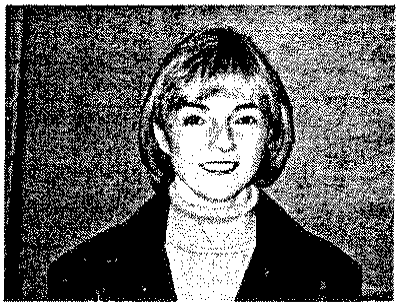
16 people including Sara know her secret.

Great!

Improving Students' Level of Achievement in Writing

Nancy Howard and Heather Noddin

Nancy Howard
Grade 2/3 Teacher
Lansdowne-Costain School



Heather Noddin
Grade 5Teacher
Lansdowne-Costain School

Nancy Howard teaches grade 2 and 3 at Lansdowne-Costain School. She has been teaching for several years and enjoys working with children. Nancy has two adult sons.

Heather Noddin is currently teaching grade 5 at Lansdowne-Costain School. She taught grade 2 and 3 last year when the research was completed. Heather has a daughter in her OAC year currently at North Park C.V.S.

Taking the Risk

The staff at Lansdowne School was approached by the Principal with the idea of becoming involved in Action Research. We had the choice of topic based on what our interests were and what we felt were the needs of our students. We chose to focus on the writing process (think, talk, draft, revise, edit, publish) with the hope of improving writing abilities in daily work, as well as, improved writing scores on the EQAO Provincial Test. Students' levels of writing in both our classes were consistently below standard and levels on the EQAO assessment were even lower with the majority of our students at a level 2.

We hoped to involve our pupils in the Action Research process by discussing our program and plans with them at each stage. They knew that our goal was to increase their understanding of the writing process, increase their ability to write for a variety of purposes, as well as, we decided we needed to inform and involve parents allowing them to practice the strategies taught at home. Hands on assignments were sent home to help develop reasoning, communication, organization and convention skills.

Our research began with our question

"How can I improve my students' level of achievement in writing?"

The Plan

The two of us decided at our first meeting that we needed strategies to achieve our goal of improved writing ability. Professionally, we enrolled in the First Step Program in Writing which gave us guidelines in assessing our pupils and placing them correctly on the writing continuum – role play, experimental, early and conventional stages. We discovered that one sample of student writing allowed us to predict which level each student may fall into, however, we learned that at least three samples were needed to accurately assess a placement on the continuum. We also learned many new strategies to improve students' writing ability based on the individual needs to assist them in developing skills to progress to the next level.

Next we decided to use the systematic approach to teaching writing strategies offered by the All Star Writing Program (Prewriting Strategies, Writing Strategies, Revising Strategies, Editing Strategies and Publishing Strategies) A copy of each was sent home in each newsletter so that the parents would have a focus. This aided in parent/teacher communication which was a goal of our school plan.

Our students' writing ability was further enhanced by regular classroom instruction offered by the Early Literacy Teacher – Bonnie Kutsche. Her focus was to increase body length in stories and letters by developing supporting detail. Students learned what constituted a 'Best Answer' and to apply that skill to writing in any area of the curriculum. Our job was to reinforce daily the suggestions of the Early Literacy Teacher.

Our next step in the plan was to collect data to assess and evaluate the progress made by our students. We chose to use the Grade 3

Writing Exemplar which was a letter to a favourite author. The Exemplar provided us with samples of each level and with a Rubric which gave us a consistent standard for assessment.

We also used a Teacher Journal to help us record observations throughout this process. We recorded successes and frustrations with our process and students' daily work.

With funds available through an Action Research Grant, we were given release time to evaluate and level after each letter writing assessment was completed. This allowed for consistency in evaluation and enabled us to become more proficient as evaluators and teaching partners.

The Process

Letter 1 – Letter to the Author

Students chose to write to a favourite author based on books read in class throughout the year. We taught letter writing format (heading, greeting, body, closing, signature, post script). We had a class discussion to develop ideas and questions which would become the body of their letter. We reviewed paragraphing skills, letter planning and focused on the conventions. Students then began with a plan or outline of their letter. This process took at least one session for most students. The next stage was to use the planner and begin their rough draft. Once the rough draft was complete students were encouraged to use their revising and editing skills to independently enhance their writing. We encouraged developing detail, using complete sentence structure, a variety of sentence types, correct punctuation and spelling, and use of dictionaries and other spelling strategies taught. The last step was to rewrite a final letter copy.

To achieve a standard, we assessed Letter One together, using the rubric provided in the Writing Exemplar Book as well as samples of letters at each writing level. We discussed with our class successes of each letter and looked at ways to improve letter

writing. We looked at the samples provided by Exemplar Book and discussed what constituted a level 1 letter, letter 2 letter and so on to level 4.

Letter 2 – Personal Letter

Based on the results of Letter One we felt that students may have difficulty writing to an author, someone they were not personally acquainted with, which may have explained why the bodies of the letters were not as lengthy as anticipated. When we planned Letter Two we decided to make it a personal letter to a family member and we incorporated it into our Social Studies Unit for that term. Again, we reinforced letter writing skills and brainstormed ideas and question techniques that they could use in their letters to develop interest, length and ongoing communication. Copies of paragraphs from the Language Exemplars were demonstrated on overheads to help develop the conventions of writing. We discussed with our class our goal to improve our writing levels on the second letter. Some copies of Letter One were put onto overheads to analyze, edit and revise to show students how easy it is to improve performance by following these examples. The same writing procedure was followed from Letter One by using a planner, rough draft, revising and editing to achieve a final copy.

Again, we followed the same marking procedure that we used in Letter One. When marking was complete, we compared the results of Letter Two to Letter One. At this point we realized our time in the school year was running short, however, we knew we needed a third sample of each child's writing to accurately place each child on the continuum. So we met to plan what the topic of our Third Letter would be.

Letter 3

With the end of the school year approaching, we decided to give the students a choice for Letter Three. They could write to a family member about their summer plans or to their next years' teacher telling them what they had learned this past year and what they hoped they would learn next year.

In class, the same brainstorming and letter writing procedures were followed as in the previous two letters. We shared with our students the graphs comparing the results of Letter Two to Letter One and discussed which areas they could improve upon in Letter Three. We were able to make graphing skills more meaningful by graphing their progress. We had three assessment category bars (Lower, Same, Better). They were enthusiastic about writing Letter Three to see the bar levels rise in the areas of: organization, conventions, reasoning and communication.

Again we marked both classes together to maintain the standard. We recorded the results onto graphs and shared these with the classes.

Staff Meeting

For Staff Development, Ruth Mills our Principal and Heather Knill-Griesser our Primary Division Consultant discussed our Action Research Goals and gave us guidelines to complete the writing process of our findings. They answered any questions and concerns and gave us confidence to continue.

Barn Meeting

We attended a couple of Brant Action Research Network (BARN) sessions for information and peer support. We were asked to share our Action Research Plan with other teachers and the BARN Committee. Never having been involved in this process before, we lacked confidence in how to professionally report our findings. They encouraged us and gave us the support and comfort level we needed to share our findings with the group, answer questions from our peers while being video taped. We left the meeting with the confidence we needed to complete the written portion of our Action Research. It was professional

growth for both of us as we are unaccustomed to speaking publicly at committee meetings. We left the meeting feeling that our Action Research was well received. (Job well done!)

Research Results
See attached graphs

Nancy Howard's Results
Nancy's results showed improvement with each letter in all areas except Conventional Level. More students left the Role Play Level and the numbers were higher in the Early Writing Level. The numbers stayed the same in the Conventional Level for all three letters on the continuum. In the areas of Reasoning, Communication, Organization and Conventions students showed steady improvement over all three letters.

Heather Noddin's Results
Heather's results showed improvement with each letter in all areas. There was a significant increase in Conventional Level letters. More students left the Role Play Level and the numbers were higher in the Early Writing and Conventional Level. In the areas of Reasoning, Communication, Organization and conventions students showed steady improvement over all three letters.

What the Students Learned
The students learned that their skill level in letter writing improved steadily over the three letters. They learned to take ownership of their performance. They were to improve their work so they could see high scores on the bar graphs. Overall, they learned a better understanding of the writing process (think, talk, draft, revise, edit and publish) which helped develop their overall confidence and enjoyment of letter writing.

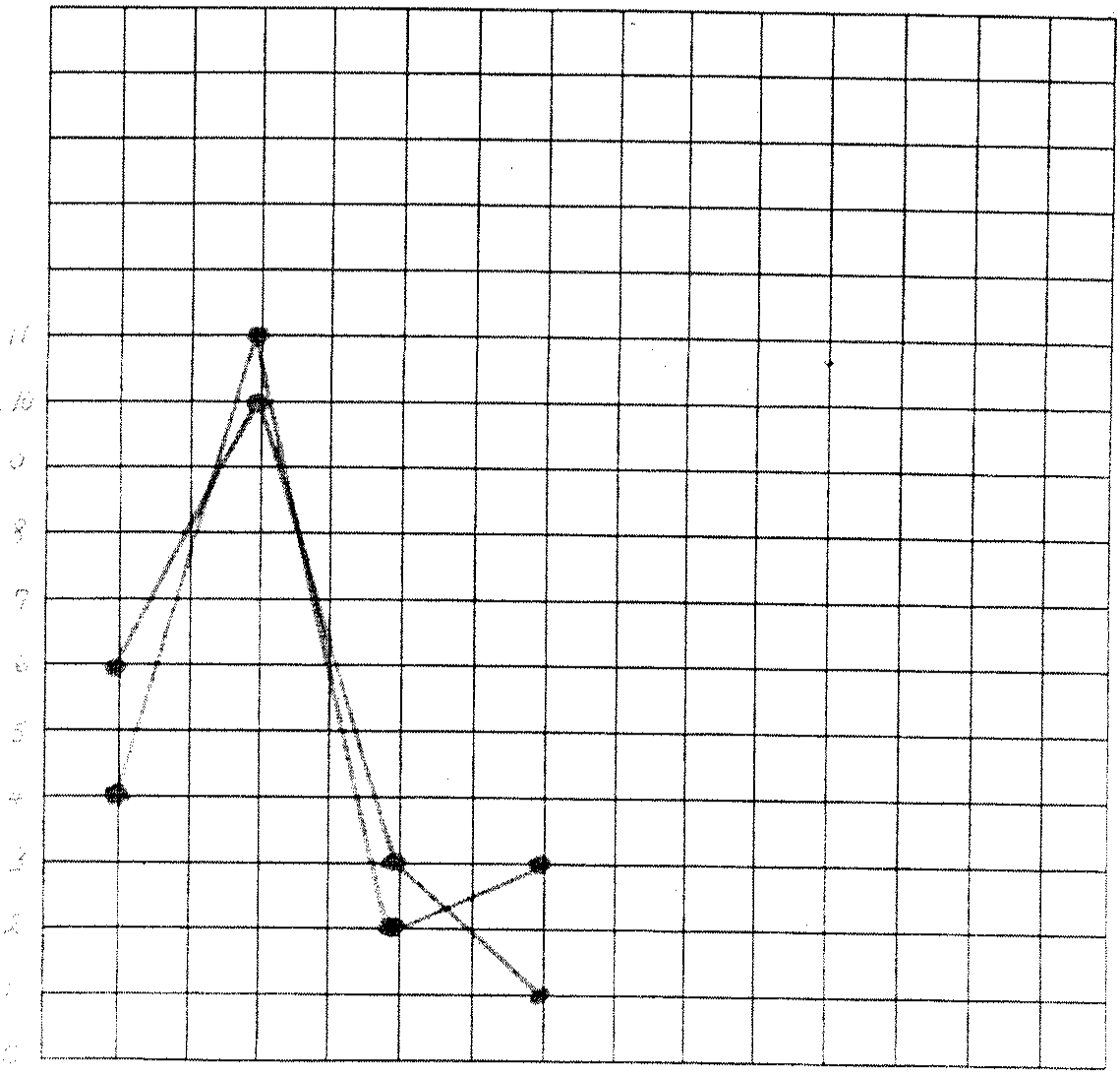
What We Learned
This Action Research Project encouraged us to take part in the First Steps in Writing series of workshops. As all professional development, it gave us greater knowledge, however, these workshops also gave us a structure to follow to complete our Action Research in a professional manner.

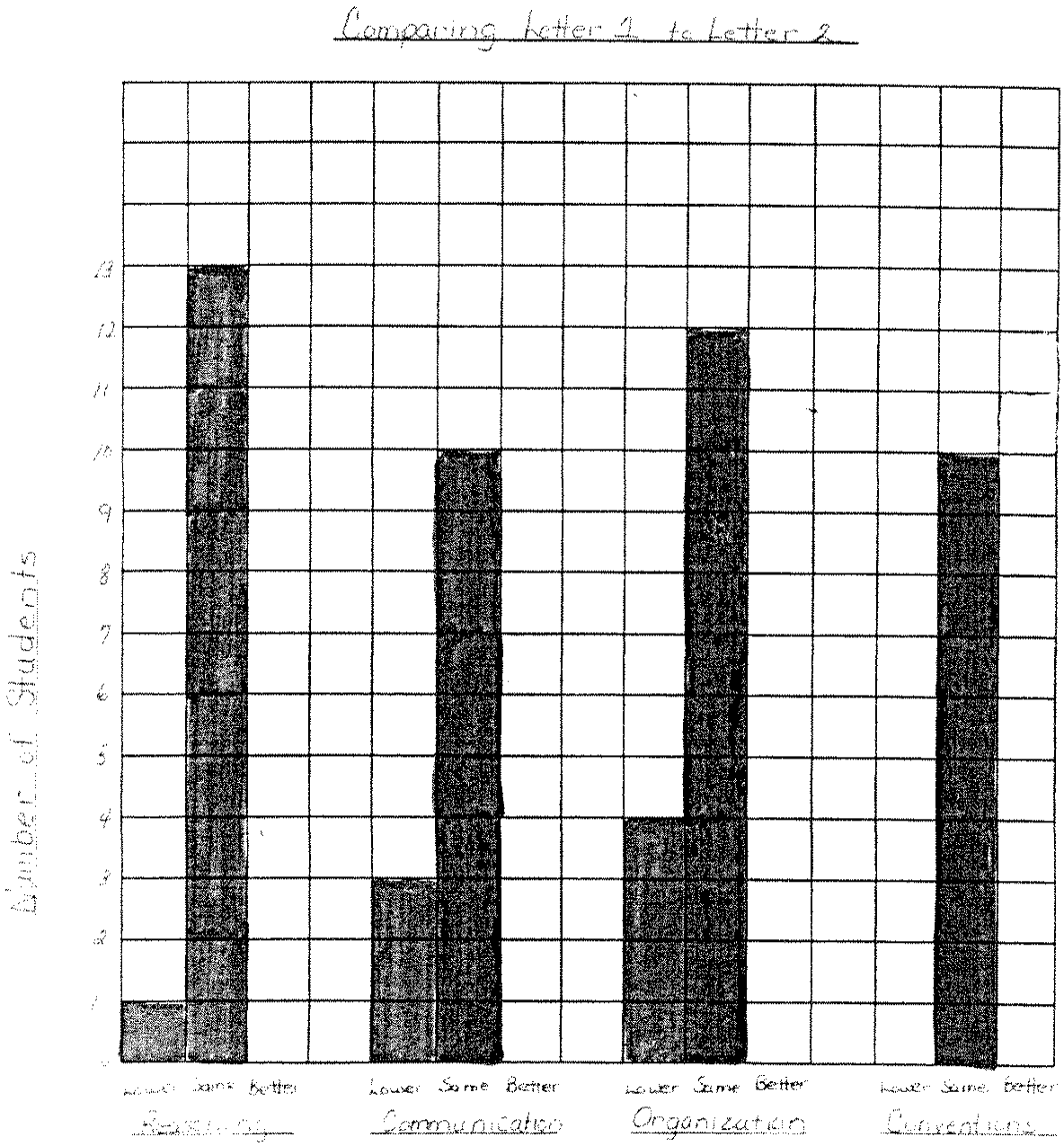
We have a much better understanding of the Exemplars and how to use them effectively. This has increased our confidence in our assessment skills. Because we did the assessment together, we have subsequently developed a close working partnership with each other.

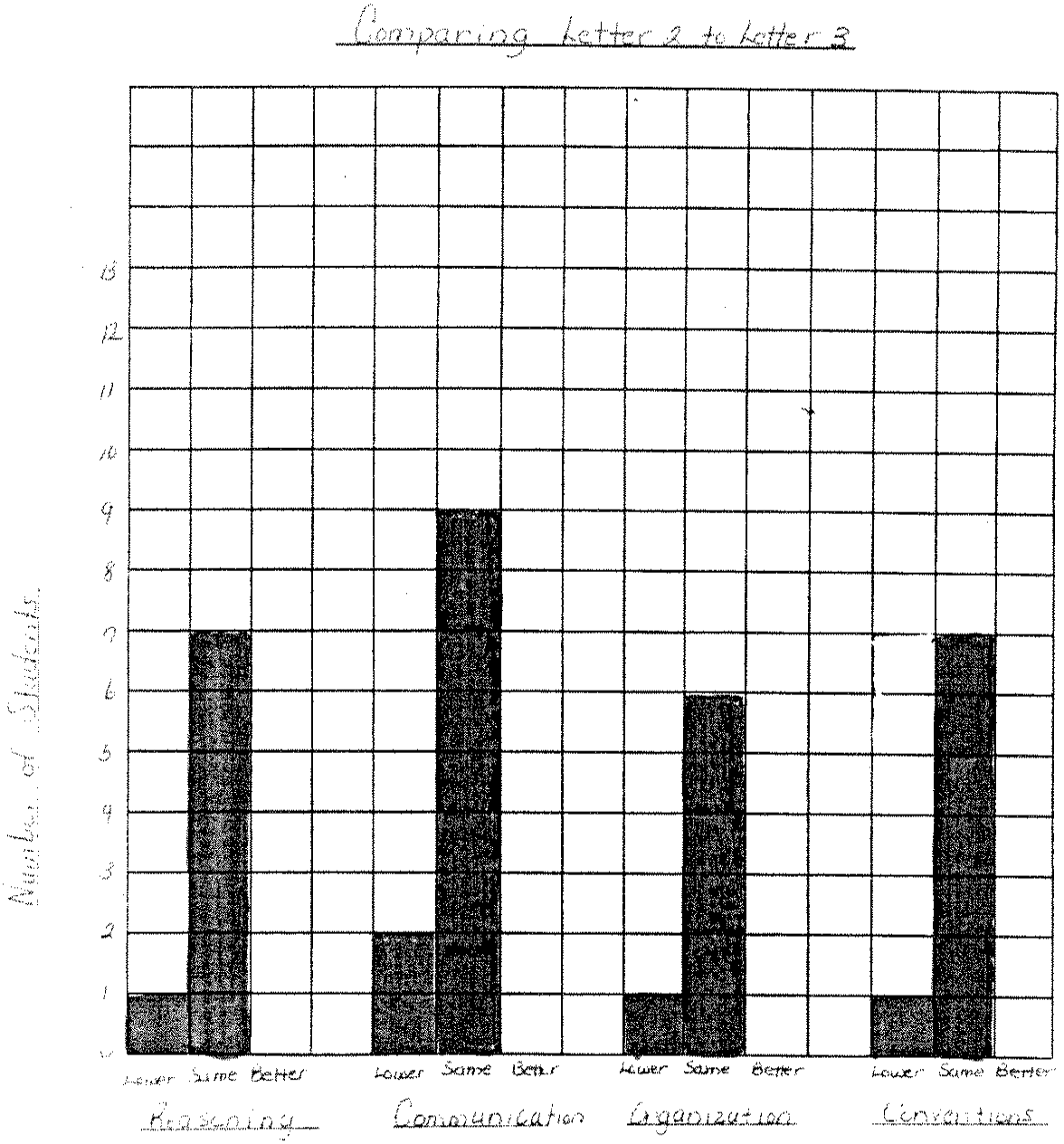
Our attendance at the BARN sessions and School Professional Development has encouraged personal growth as we watched others in their endeavors.

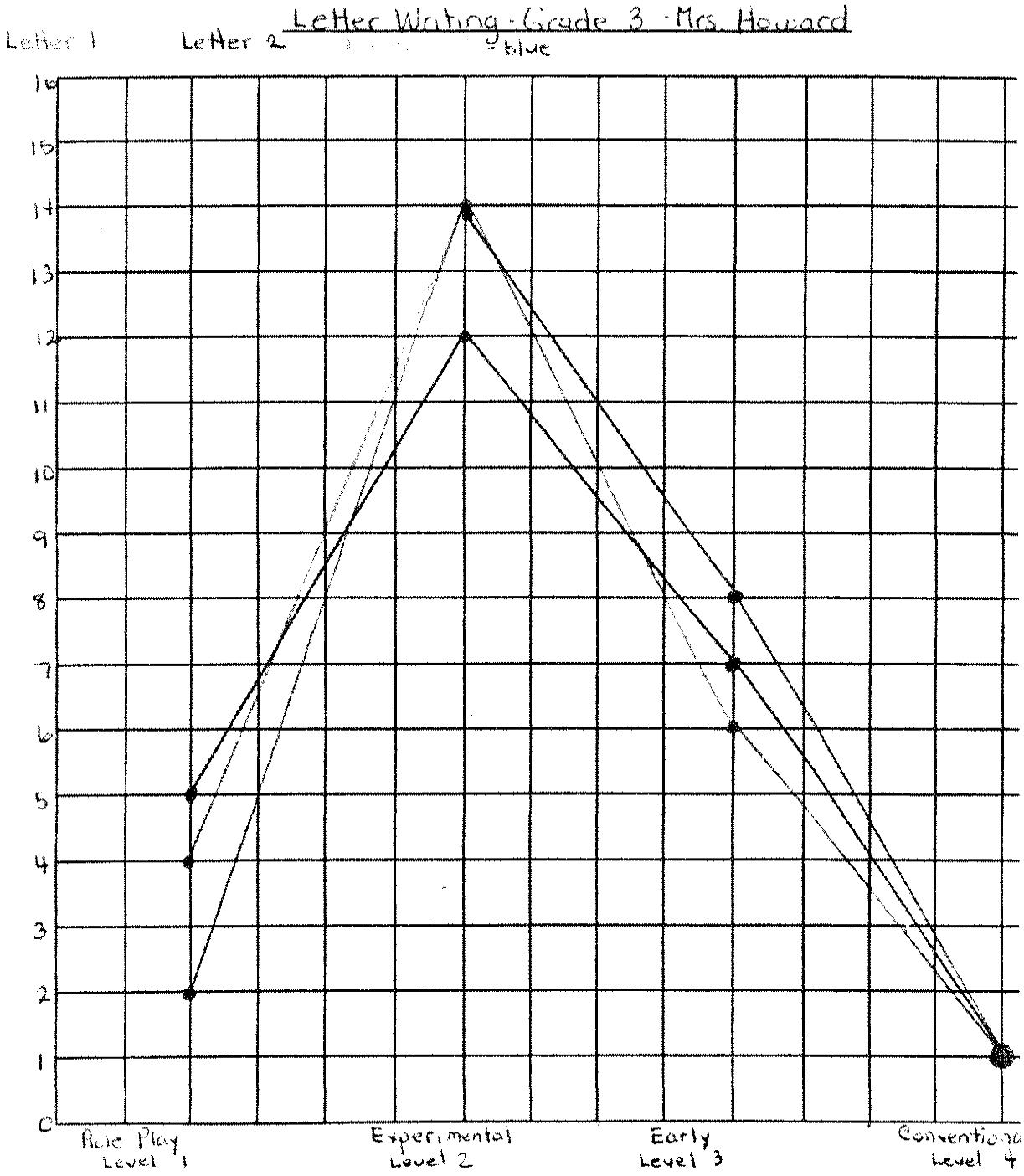
The writing of this report has given us the confidence to write a report of this magnitude.

Changes I Would Make Next Time
The main change that we both feel we would make is to allow more time to complete the actual research for our Action Research. We would do this by starting earlier in the school year. We would also make a conscious effort to write more regularly in our journal as we found these notes helpful for student observation/assessment and to remind us of the steps that we took in our research and evaluation process.

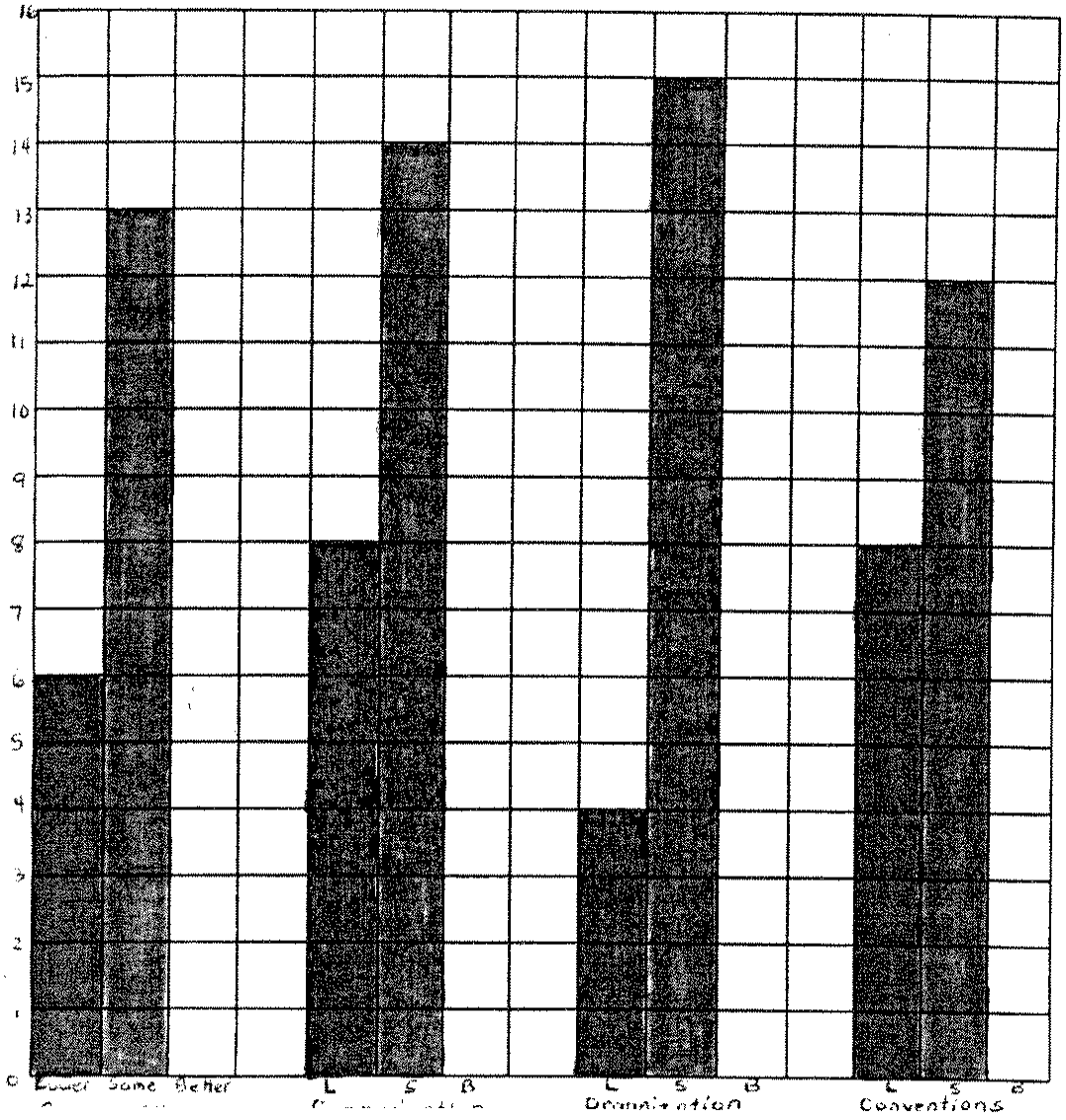


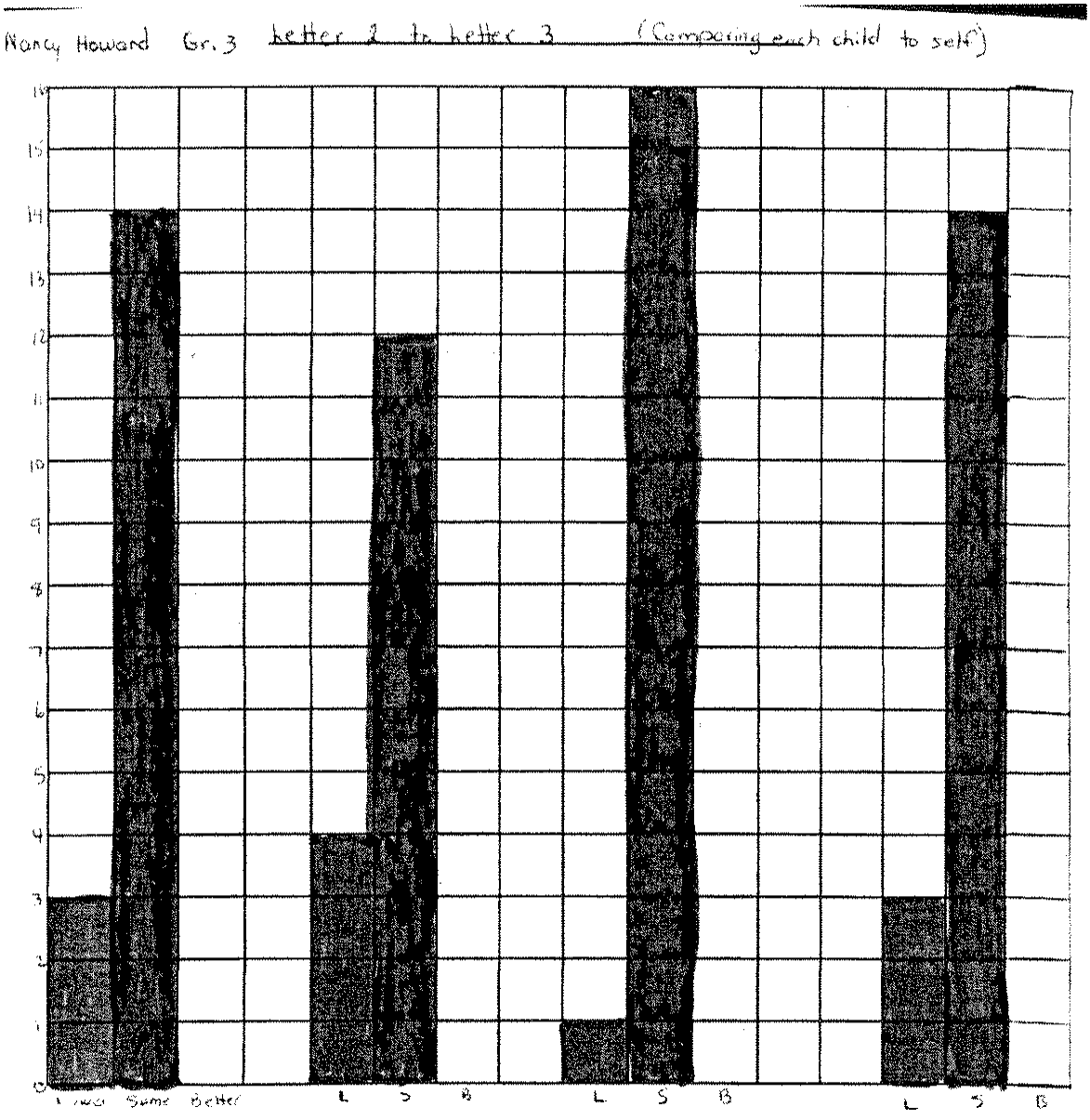

Comparing Letter 1 to Letter 2
Number of Students
Lower Same Better
Lower Same Better
Lower Same Better
Lower Same Better
Communication
Organization


Comparing Letter 2 to Letter 3
Number of Students
15
12
11
10
9
8
7
6
5
4
3
2
1
0
Lower Same Better
Reasoning
Lower Same Better
Communication
Lower Same Better
Organization
Lower Same Better
Conventions


Letter Writing - Grade 3 - Mrs. Howard
Letter 1
Letter 2
blue
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
Role Play
Level 1
Experimental
Level 2
Early
Level 3
Conventional
Level 4

Nancy Howard Letter 1 to Letter 2 (Comparing each child to self) Gr. 3





Nancy Howard & Heather Noddin, GEDSB, 2001
PC Concepts 2001

Improving Children's Knowledge of Math Facts and Problem Solving Skills

Margaret Juneja

Margaret Juneja
Vice Principal
Doverwood Public School

Margaret Juneja graduated from the University of Manitoba and maintains an interest in the areas of Action Research, professional development and leadership.

Abstract:

This paper came about because, as a Grade three teacher, I was concerned about improving how my class thought about math, what skills they knew, and how to increase their knowledge so that they would be competent problem solvers by the time that they had to write the provincial tests in May. By examining and improving my own teaching practice, I brought about a change in the classes attitude and ability in math problem solving.

The Question:

> *"How can I help make my class efficient problem solvers while increasing their knowledge of the basic math facts?"*

My concern arose because my class entered Grade three with little knowledge of even the addition and subtraction facts. In other years, I felt that I had given the children lots of practice in solving word problems. I had given them daily problems to solve but was not as methodical as I should have been in my approach to helping the children improve. The results on the last year's EQAO testing showed that many of my class were not proficient in this regard.

In the Math Knowledge/Skills Category these were last year's results.

Problem Solving

Level Achieved:	1	2	3	4
No. of children	5	6	2	

Understanding Concepts

Level Achieved	1	1	3	4
No. of children	7	3	3	

Application of Mathematical Procedures

Level Achieved	1	2	3	4
No. of children	5	6	2	

Communication of Required Knowledge

Level Achieved	1	2	3	4
No. of children	7	5	1	1

I decided to try a two-fold approach to help to change the way that I taught Math. I started by making up sets of flash cards in the four fact areas and sent them away to be reproduced on card stock. I made up enough so that my class could work in pairs. Every day they would drill each other on the stack of cards and then have a three-minute, fifty question quiz. The quizzes became harder as time went on. The marks were recorded every day so that improvements could be charted.

My other strategy was to directly teach all of the twelve problem solving strategies.(See appendix).I originally hoped to teach two methods a week but soon realized that this was too much. I settled down to teach one a week. To teach each skill, I did it in several steps. First, I modeled the method. I went over how it was done and asked questions as I went along. The class copied this first example into a separate problem solving notebook. The second time, the children worked on a similar problem in pairs. All of their work went into the problem solving notebook. The solutions were gone over and evaluated. In other words, the children were told whether their answer would be considered a level four, three, two or one. At first, the children wrote simple, incomplete solutions but gradually, many of them were able to write very complex answers. I continually reinforced the ideas of using pictures, numbers and words to show solutions. I also encouraged the use of precise math language to communicate their ideas.

Exceptionally good solutions were praised in class. The third time, the children worked on the problem individually. All solutions were graded. Verbal corrective feedback was given in all cases in order to help the children improve their answers. I always tried to point out what the child was doing that was correct, as well as areas in which they needed to improve in order to give a better response. On several occasions the problems were sent home so that families could work on them. Even the parents had difficulty with some of them! I would ask the children how long they took to work out the problem. Often, an evening would be spent working on them.

One parent commented that their child had great difficulty with the problem but that they persisted until the child was able to understand. Another mother, who happened

to be in the school volunteering, popped her head in to ask if the solution the family has worked out was correct. I even heard comments from other teachers who had siblings of my students in their classes as to how families had worked on the problems together. One child, in a spontaneous comment, told me that the problems were getting easier. Another child, after learning a few of the strategies, actually used an earlier learned strategy to solve that day's problem. I made sure to point that out to the class to show them that there are many different ways to solve problems. As long as the solution is correct, the method may differ and still be acceptable.

I made a point of telling the parents on Interview Day in December that I had undertaken this project in an effort to improve the children's performance in Math. Most parents were very encouraging and said that they were willing to help their children learn the math facts at home in order to increase their competency. However, I did receive one negative comment from a set of parents. They came in demanding to know if there was a Grade Three Curriculum and if it was being taught. The previous year's test results were already known and they were not happy with them. I explained what I was going to do about it and they left the interview in a better frame of mind. There was also one negative comment that came back on page three of the first report card. The parent had written that "given the poor results of the school last year" she hoped that her son would be ready to write the Grade three tests come May.

By the end of December, I had taught six of the twelve problem solving strategies and had drilled the addition facts to eighteen and almost finished with the subtraction facts .I had kept track of the results of the daily quizzes and most of the children were significantly improved in their recall of the facts taught so far. I had also tried using corrective feedback with my class as the result of giving them a test on subtraction and then going over the questions, one by one, asking individually if they needed more clarification, and then giving them another test a few days later. Most of the children did significantly better the second time around .I had told the children that I would keep the higher mark.

By the end of January, I was starting multiplication, which few of the children had any knowledge of. The same pattern was followed, of daily flash card drill with a partner, followed by a three minute, fifty question quiz. By examining my formative results to the daily quizzes, I could see that many of the children were improving in their recall of the facts.

By the end of March, I had finished teaching and testing the multiplication facts and was starting division. In other years, I had found the children have trouble with division. But this year I was pleasantly surprised! This class quickly understood the concept and realized that division is the opposite of multiplication. They continued to do well on the daily quizzes. I can only believe it was because they were so competent in their knowledge of the facts that once they understood the relationship between multiplication and division, they were able to find the answers. I had also taught most of the problem solving strategies. As I observed the children work out their problems, I was amazed to hear the math language that they used and that they were usually on task. They took great pride in being able to come up with the answer and were eager to show me their written responses. I continually stressed that they must communicate not only how

they solved the problem but why they tried a certain procedure.

Even before the time for the provincial testing in May of that year, I did not really have any hard data to show that my methods of teaching math had been effective in increasing the math scores. I did know however, that my class's attitude towards math had certainly improved.

On the whole, they were eager learners, always willing to try and displayed both confidence and competence in their approach to math. For myself, I had become excited about this way of teaching math problem solving skills. I could see the results clearly in the written responses that the children gave. I was able to focus more on the process that the children used rather than the product. I gave much more corrective feedback, both oral and written. Seeing a child smile when you tell them what a great answer they have given is certainly a wonderful reward. My assessment methods changed in that I made sure to build in a time for the children to have another chance to try an assignment, after corrective feedback had been given.

This past fall, even though I was at another school, I contacted my former principal and asked if I was able to access my former class's results to see if there was concrete data to support the teaching methods that I had adopted. The results are shown in the following charts and really emphasize how examining one's own practice to improve student learning can have dramatic results.

Following the list of resources are charts, some problem examples, and some samples of children's work.

Appendices

Examples of Classroom Assignments

1. Problem Solving Strategies; and Look for a Pattern
2. Construct a Table or Chart; and Make an Organized List
3. Act it Out; Draw a Picture or Diagram; Use Objects
4. Guess and Check; and Work Backwards
5. Write an Equation; and Make a Model (#1)
6. Make a Model (#2); and Make a Model (#3)
7. Logical Reasoning; and Solve a Simpler or Similar Problem

Examples of Students' Completed Assignments

1. Super Darts
2. Super Duper Camp Fire
3. Guess and Check

LIST OF MATH RESOURCES

Text Books

Quest 2000, Exploring Mathematics
Publisher: Addison Wesley
Journeys in Mathematics
Publisher: Ginn

Resources

Daily Problems and Weekly Puzzlers
Publisher: Ideal
The Problem Solver
Publisher: Creative Publications
Linking Assessment and Instruction in Mathematics
Publisher: Ontario Association for Mathematics Education

This article was published in the Ontario Action Researcher at: www.unipissing.ca/oar

Margaret Juneja, GEDSB, 2000
PC Concepts 10(0)

PROBLEM SOLVING STRATEGIES

1. Look for a pattern
2. Construct a table or chart
3. Make an organized list
4. Act it out
5. Draw a picture or diagram
6. Use objects
7. Guess and check
8. Work backwards
9. Write an equation
10. Make a model
11. Logical reasoning
12. Solve a simpler or similar problem

LOOK FOR A PATTERN

1.As you are walking down a street, you notice that the houses are numbered in the following manner: 304, 312, 320.
What would the next five numbers be?
Write two patterns you notice about these five numbers?

2.How many x's will there be in each line of the fifth group? Draw the figure.

X	X	X
X	X	X
XX	X	X
	XXX	X
		XXXX
Group 1	Group 2	Group 3

3. Explain what is being done in this pattern sequence. Then figure out what the first three numbers would be.

___ ___ ___ 8 16 18 36 38 76 78

CONSTRUCT A TABLE OR CHART

1. There were 12 people at a party when they started to leave. In the first hour, 2 people left. In the second hour 4 people left. People continued to leave. Every hour 2 more people left. In what hour were there no more people at the party?

2. There were 30 children in class at recess. In the first two minutes, 2 children left. In the second two minutes, 4 children left. Children continued to leave. How many minutes did it take for all the children to leave? Every two minutes 2 more children left than before.

3. While walking to the school on Monday, Tim saw 5 birds. He saw 10 birds on the way back. The next day, he saw 7 birds on the way to school and 14 on the way back. The following day, he saw 9 birds on the way to school and 18 on the way back. If this pattern continues, how many birds will Chris see on each of the next five days? Use a T-chart to show your answers.

MAKE AN ORGANIZED LIST

1. Matt has a $1.00. He goes to the store where erasers are 10cents, pencils are 50 cents and pens are 20cents. How many different combinations of school supplies can he buy?

2. Jane is playing darts. She could land on 10, 20 or 30 points. She has three tries to get a good score. She got a score of 30. How many possible combinations could she have got to get that score. (0+0+30 is different from 0+30+0)

3. Bob was shooting arrows at a target. He could hit 10, 20, 30 or 40. He had three tries. After three tries, his score was 40. How many different combinations could he have to get this score? Remember that 0+0+40 is different from 40+0+0.

- Act it Out
- Draw a Picture or Diagram
- Use Objects

ACT IT OUT

1. 23 children form relay teams. Each team must have 5 children. How many children cannot join a team?

2. Ivan has a secret. He whispers it to 3 classmates. Each classmate tells 3 others. How many know the secret?

3. Wayne shares 23 marbles equally with Tim, Joe and Sue. How many are left to give to Wayne's little brother?

DRAW A PICTURE OR DIAGRAM

1. How can 16 members of a marching band form a square?

2. 17 people sit around a campfire. Then 6 people join them. 8 people leave. Later 10 more people leave. How many are left around the campfire?

3. 33 children hear the school bell. 11 children go to the library. 2 go to the office. The others come to their seats. How many come to their seats?

USE OBJECTS

1. "Attention class," said the teacher. "Today, Herbert Hornet is going to talk about bees." Sitting in front of Herbert was Gladys Fly. She was to the right of Bonnie Bee. Franklin Flea was between Gladys and Timothy Tick. Wally Wasp was seated beside Franklin and in front of Miguel Mosquito. How are the students arranged in the classroom?

2. Five children catch 16 fish. They share them equally. How many fish are left over to give away?

3. 20 birds were sitting in the oak tree. 3 flew away to another tree. 6 came to sit on the oak tree. Then 5 birds flew to the ground. How many birds were sitting in the oak tree?

- Guess and Check
- Work Backwards

GUESS AND CHECK

1. 26 27 28 29 30 31 32 33 34 35 36 37

I am thinking of two numbers that are next to each other. Their sum is 73. What are the two numbers?

2. 1 2 3 4 5 6 7 8 9

The sum of three numbers that are next to each other is 18. What are the three numbers?

3. Sharon bought stickers that cost 5 cents, 4 cents and 2 cents. She paid 30 cents for 10 stickers. How many of each did she buy?

WORK BACKWARDS

1. Some children left the classroom. In the second minute, 2 more children left than had gone in the first minute. Every minute, 2 more children left than had gone in the minute before. In the fifth minute, 16 children left. How many children in all left the classroom?

2. A group of people were leaving the theater. In the second minute, 3 more people left than had gone in the first minute. Every minute, 3 more people left than had gone in the minute before. In the seventh minute, 19 people left. How many people in all had left the theater?

2. Ketchupia is famous for its sauce. One day the recipe disappeared. The Queen ordered the Knights to look for the recipe. They did not return. On the second day she sent out 4 more knights than she sent the first day. Each day the Queen kept sending out 4 more knights that she had sent out the day before. Nineteen knights went looking on the fifth day. How may knights in all did the Queen send looking for the recipe?

WRITE AN EQUATION

1. Your teacher has put you in charge of organizing transportation for your field trip to the aquarium. You are going to travel by car. You have 25 students in your class and 5 cars to put them in. How many students will be in each car? Show the answer in four ways: by adding, subtracting, multiplying and dividing.

2. Who has more cards?

Tom began with 12, traded four away, but got 5 in trade, bought 7 at the store, got 11 more for Christmas and gave away 6 to a friend.

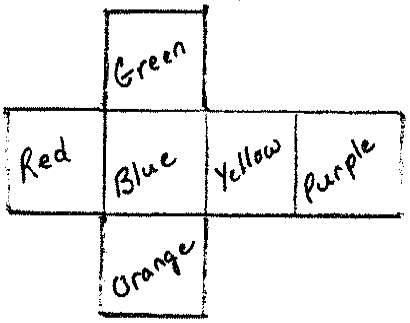
Tim started with 45 cards, gave away 24 to a friend, bought 4 more, traded away 6 good cards for 10 plain ones, lost 2 cards and gave 3 to his sister.

3. Figure out how many years ago each thing was invented. Which invention is the oldest and which is the youngest?

1929 yo-yo
1926 miniature golf
1990 rollerblading
1962 video games
1975 skateboarding
1895 movies and movie theaters

MAKE A MODEL

1. Fold the net into a cube. Colour the sides as indicated. Write the colours of the opposite faces.



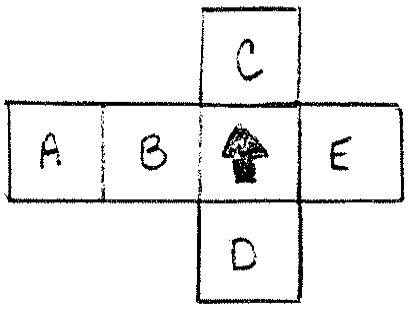
2. Two cubes are made from these nets. In which positions shown below would the cubes have:

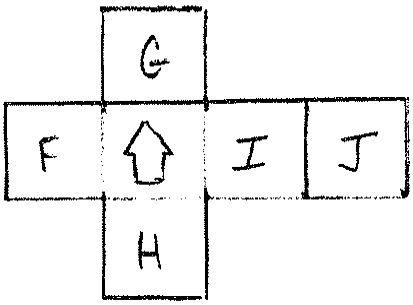
a) black arrow up
and the light arrow down

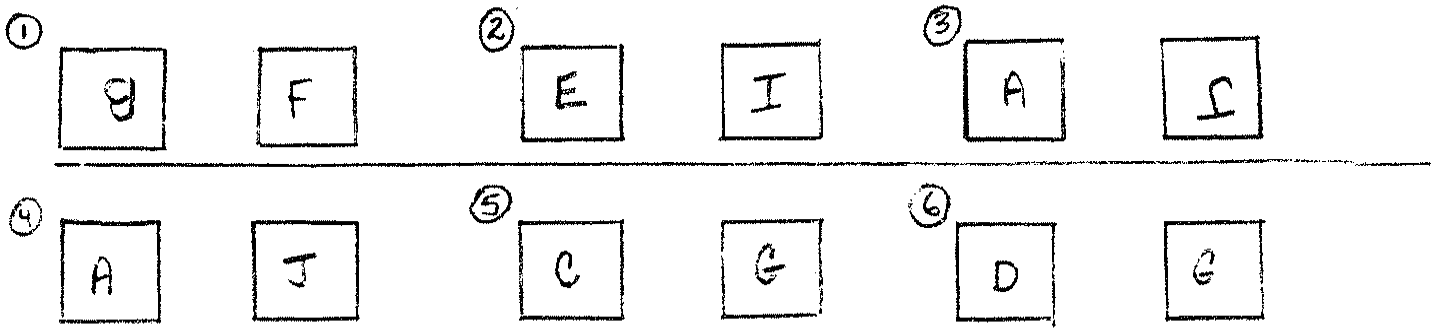
b) black arrow down
and the light arrow up

c) both arrows up

d) both arrows on bottom faces?







3. Place 8 pawns on a chess board so that no two pawns lie on the same row, column or diagonal.

LOGICAL REASONING

1. What is the missing number? Remember to try your answers in each of the equations.

$X \times Y = 12$ $Y - X = 4$ $Y \times Y + X + X - Y = ?$

2. George the Dinosaur is 15 years old. His father is 59 years old. How old was George's father when George was 4?

3. When the brothers Tom and Tim were asked their ages, they replied with a riddle. The riddle had three parts.

Tom is 25 years older than Tim. Tim is 25 years younger than Tom.
Tom's age is even, Tim's age is odd.
Add their ages together and get 63.

How old is each brother?

SOLVE A SIMPLER OR SIMILAR PROBLEM

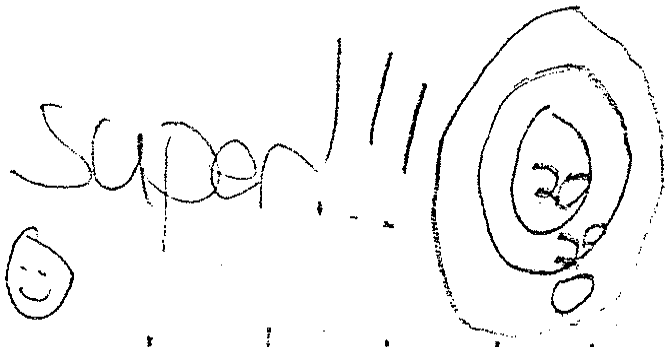
1. Three children are on the way to school. They find 50 cents and turn it into the office. After a week, nobody claims it so they are told that they get to keep it. How are they going to divide the money? (Because 50 cents is not easily divisible by 3, have the children solve dividing 30 cents by 3 to see the strategy and then doing 50 cents.)

2. How would you divide an apple evenly between three children? (First, have the children try dividing an apple into halves and then into quarters. Once they have this concept, they could try thirds.

3. How many chickens and how many ducks are there if you have 42 legs altogether? (First have the children try smaller numbers such as 8 or 10 legs. Once they have the idea, then use the larger number. This problem will have more than one solution.

➢ 1.. Super Darts

Bob was playing darts. He could land on 10, 20 30 or 40. He had 3 tries. After 3 tries his score was 40. How many different combinat could he have to get this score? Remember 0 + 0 + 40 is different from 40 + 0 + 0.



level 3 + D 15

try 1	try 2	try 3	
1. 0	20	20 ✓	
2. 20	0	20 ✓	
3. 20	20	0 ✓	
4. 30	0	10 ✓	
5. [illegible]	30	10 ✓	
[illegible]	[illegible]	30 ✓	
7. [illegible]	30	0 ✓	
8. 20	10	10 ✓	
9. [illegible]	20	10 ✓	
10. [illegible]	40	0 ✓	
11. 40	0	0 ✓	
[illegible]	0	40 ✓	

You can make ... 15 com...

I did it !!!!
finaly I got level 3+
thats my best mark I got.

Super duper 3t

➢2.. Super Duper Camp Fire

17 people sit around a campfire. Then 6 people join them. & people leave. Later 10 more people leave. How many are around the campfire?

there is 5 people left around the campfire. I drew 17 peaple around the campfire then I put in 6 more people Then I took 8 away then I took away 10 peaple that is how I got 5.

$26 + 27 = 53$ $30 + 31 = 61$ $31 + 32 = 63$ $35 + 36 = 71$ $36 + 37 = 73$

Guess and Check

26 27 28 29 30 31 32 33 34 35 36 37

I am thinking of two numbers that are next to each other. Their sum is 73. What are the two numbers?

I guessed two numbers and added them. My awnswer was 53. It was too low. I kept guessing higher numbers. When I guessed 36 and 37 my answer was right.

Improving Thinking and Communication Skills of Junior Students

With Emphasis on Practicing Oral Techniques and Better Habits

Anda Kett

Anda Kett
Grade 5/6 Teacher
Bloomsburg Public School

Anda Kett earned an Honours Degree in Fine Arts at McMaster University and went on to obtain her Primary to Secondary Bachelor of Education at the University of Toronto. She has taught at the Junior level for the last 11 years. Currently, she is a Grade 5/6 teacher at Bloomsburg Public School.

"Will The Thinking/Language/Communication/Writing Skills Of My Grade 4 Students Improve With More Deliberate Emphasis On Oral Patterns And Habits?"

Focus Question

"How can I effectively improve the language skills of my (weakest) Grade 4 students to meet grade level standards?"

The five students in question are currently working at Level 1 and 2 on the Ontario Achievement levels, and three of them are identified as special needs students. I would like to improve their performance so that they are able to produce material that is at least a more consistent Level 2, and perhaps in the long term the occasional Level 3. Because of their current language skills, they are having difficulty in other areas of school, and are therefore in dire need of some confidence enhancement. .I feel that focusing on the oral habits and patterns of these students will improve their language awareness, and then hopefully their ability to communicate ideas more effectively. Throughout the year I've noted that flaws in written work are also often reflected in the way these children speak. Their hearing has been discussed, and it has been confirmed that there are no physical or auditory problems.

Why Is This Issue Important?

Let me explain my rationale. When we are unable to communicate a thought clearly, we are at a serious disadvantage. This applies to all aspects of life. Speech problems in the primary years are addressed with more enthusiasm, but once a child hits the junior years, the errors are more subtle and are often overlooked as something "he'll grow out of in time, as he gets more exposure to proper language. "However, our students are not always exposed to proper language use throughout their daily lives, and consequently they develop sloppy habits that continue to reflect negatively on them.

Our society has exposed the younger generation to massive doses of slang, incorrect grammar, and poor spelling in advertising and the media in general. Children are entertained by characters who babble on in incoherent, disconnected or rambling thoughts. The child's amusement often leads to the desire to emulate those behaviors and, though they may go through phases, these ideas eventually become bad habits. Awareness and appreciation of good language and good values needs to be brought back to the students.

In making the connection between oral and written language for the students, I hope to bring them to a higher level of functioning where they will be more comfortable with language and function at a more independent level when they are promoted to the next grade. If this group does not show significant improvement in their language skills soon, their future will include many struggles, one of them being the Grade 10 literacy test. They also happen to be students who will likely be in my class again next year and who will be unable to cope with the demands and material of the Grade 5 program.

The Process That Was Followed

With the assistance of consultative staff, I analyzed the Grade 3 EQAO Language test results for my students. The results were then compared with the level of work that they were demonstrating this year in their classroom work. The same test was then given in the second term (in their Grade 4 year), and those results were compared with last year's. In addition to the testing and anecdotal observations, emphasis in the classroom has been put on oral communication as much as written skills.

Language has been practiced through various methods such as: discussions, book talks, informal oral reports, formal speeches, listening to stories, story telling and responding to stories, rehearsing of stories before writing, and daily log book writing.

The focus in written work was on sentence structure, grammar, vocabulary/wording, and spelling. Then, as ideas began to develop and become more complex, the focus was extended to idea development, sequencing of ideas, and paragraph structure.

Data Collection and Analysis

As time went on, it became clear that my expectations were progressing faster than the students' skills and that the levels of achievement were beginning to decline. When I found that they were unable to develop a complete paragraph, we went back to the concept that thoughts can be extended and developed to reveal more detail and to answer more questions. Relationships between ideas were explored. As their awareness of this improved slightly, they were occasionally able to explain more orally; however, getting it down on paper was still too challenging for them. The data that were gathered to reveal this were taken from formative evaluation on various activities stemming from a novel that was read to the class. This ensured that the results were reflecting the students' ability to think and communicate their thoughts, not solely on their ability to read, or write. Transcripts of oral, one-on-one questioning revealed that some of them were able to answer some questions more clearly after all!

However, their responses were still very brief and simple, and would be assessed at Level 1 or 2. This was, however, definitely an improvement over a blank piece of paper, which is what some of them handed in at first.

The novel in question was "Hatchet," by Gary Paulsen, a story about a boy's survival in the wilderness of northern Canada. I read the story to the students. It fit in well with the habitat component of the curriculum and is an inspiring novel which hooked many of the more advanced students on the author. Many aspects were discussed in class and reinforced during the reading of the novel to ensure the continuous understanding of the many inter-related themes.

I found that class discussions did not help in the formative assessment of the students in question because they were reluctant to participate and the more vocal students dominated the entire experience. After hearing some of the others' ideas however, I wondered how their ideas might have affected the responses of those students involved in the study. As it turned out, there was no sign of any long term carry over of ideas. Is this due to lack of listening or understanding?

Some examples of the oral questions and responses:

Case #1

Teacher: If you were lost in the woods, what would you do (the same as Brian)?

Student #1: Build a shelter, wall, big sticks. Hit hatchet on something, learned how to kill food, make spears.

Teacher: Did Brian change in the story?

Student #1: Yes.

Teacher: How?

Student #1: First he didn't know what to do and later he did. He didn't give up.

Case #2

Teacher: How did he learn to find the fool birds before they flew away?

Student #2: Camouflage.(They would "blow up" in his face many times before he was able to identify their shape, not just their colour. Then he was able to hunt them.)

Case #3

Teacher: How did the eating of the fish change Brian?

Student #3: He never ate fish before.

Teacher: Do you think that catching the fish had something to do with a change in him?

Student #3: Yes.

In order to build on responses from the students, I made an effort to make sure the questions and the expectations were clear and would often rephrase and repeat them. I provided corrective feedback to any response received, and I encouraged further thinking. Ideas were classified according to levels of evaluation, and improvements were added to demonstrate higher level thinking. Thus, corrective action and formative assessment were continuously used in classroom modeling and in personal evaluation.

Findings

The following table gives a brief overview of the levels of achievement of selected students in the EQAO tests, (the official test given in Grade 3, and the repeated experience in the second term of Grade 4), and a summative evaluation of their overall achievement in Language Arts.

Students #1, 4 and 5 are identified as special needs students with modified programs.

Levels of Achievement in Reading

	Provincial Gr. 3 Test Repeated	Gr. 4 Test	Overall Classroom Evaluation
Student #1	1	1-2	1
Student #2	2	2	2
Student #3	3*	1-2	1-2
Student #4	1	1	1
Student #5	1	1	1

* This student was accommodated at another school the previous year. He was given extra time, and answers were scribed for him.

Levels of Achievement in Writing

	Provincial Gr. 3 Test Repeated	Gr. 4 Test	Overall Classroom Evaluation
Student #1	2	1	2
Student #2	3	3	2
Student #3	3*	2	2
Student #4	2	1-2	2
Student #5	1	1	1

Both the examples of the oral responses and the provincial assessments demonstrate that the levels of thinking skills are quite basic. These students have difficulty retelling parts of the story. Relating and reflecting skills need significant assistance and prompting. The overall evaluation is based on an average of the combination of skills reflecting reasoning, communication, organization, and use of language conventions on the Grade 3 Provincial Test.

I find that the levels of responses in classroom assessments in Grade 4 are fairly consistent with their performance in the EQAO tests. Under the conditions of the test, 4 out of 5 students were not accommodated at all, and thus scored pretty

consistently at Levels 1 and 2, which is comparable to the level of the work produced in class, when done independently. Even with oral prompting from the teacher, the responses continue to be brief and simplistic.
I find that all of the students studied in the research are hesitant to participate orally in class, and need encouragement and prompting to do so. Even personal discussions with them are very one sided, with the teacher/ adult always leading the train of thought. It seems that these children have had little practice expressing their ideas up to this point in their lives and that little encouragement has been provided in the area of relating ideas to each other. Things are accepted at face value for these children.

Conclusions and Next Steps

It seems to me that for them, asking the questions, (who, what, when, where, why, how) will need a lot of modeling, encouragement, and practice. Unfortunately, these skills are needed in many areas of school in the junior years and these students are just beginning to be aware of them. Questioning and thinking skills need to be started earlier by primary teachers and by parents, in order to prepare the child for the increased demands of the curriculum.

Once the thinking skills of the students start producing more detailed ideas, the reasoning, organization skills, and language conventions will have more meaning to them and they will have something more concrete with which to work. So far their communication skills appear to be weak because they have so little to share and therefore have not had enough experience practising these skills.

Changes in evaluation practices need to be made to accommodate those students whose thinking cannot be clearly communicated. Summative evaluation needs to be supported with numerous and various formative assessments. Anecdotal records are a valuable tool in identifying the progress of the student. Modeling of the process and of expectations needs to be consistently practiced by the teacher to establish better understanding of the concepts. This gives students a more concrete view of where they fit in, and what they need to do to improve.

I attempted different communication techniques throughout the research and found some more successful than others. However it is important to continue to work on the strengths of those that worked, and to improve those that didn't work so well. The students need to have a variety of purposes, goals, and audiences to give their words meaning. Whole class discussions should be combined with small group and one-on-one conversations. The sharing and recording of ideas can be accomplished in many ways by the students and by the teacher. Through these experiences, I hoped that the weaker students would build an awareness of better communication skills, and start to improve their own.

One year is a short time to expect dramatic change. I now have a better understanding of my students' performance levels and of what teaching strategies worked better than others.

This article was published in the:
- ONTARIO ACTION RESEARCHER -
V.4.1.3 - Papers – 2001

Anda Kett, GEDSB, 2001
PC Concepts 10/01

Improving Written Communication in Math

Fran Lainson

Fran Lainson
Primary Teacher
Grand Erie District School Board

Currently in her tenth year with the Grand Erie Board, she is on maternity leave with her second daughter. Over the last ten years, Fran has taught all levels from kindergarten to grade eight. She has her Primary specialist qualification and prefers teaching primary to the other levels. Fran also has her Visual arts specialist.

School Profile
North Ward Public School is located in Paris, a town of 8400 people in South Western Ontario. The school has a population of 500+ students. I t is a JK – 8 school, with two grade six and three grade seven teachers. Much grade collaboration occurs amongst staff. The majority of students have English as a first language.

Teacher Profile
The grade seven teachers meet regularly to discuss curriculum and programming. To supplement classroom instruction, additional support is available to students who are struggling with grade level material and/or personal kinesthetic control. I have worked in collaboration with the grade six teacher on the action research project aiming to improve students' test scores in the written communication of mathematical procedures.

Class Profile
This year, the grade six class has twenty-seven students. The grade seven class has twenty-six students. There are two other grade seven classes in the school. The grade seven students are a combination of two different schools in Paris which have been randomly mixed. Some rotary occurs with sessionals, however teacher collaboration allows for some integration of subject matter. There are three identified students in the grade seven class, one being integrated full time from the Special Education (Communications) class. Two students are on formal IEPs for weaknesses in Mathematics and Language. Two other students are on informal IEPs to encourage maturity of work habits.

What is the question?

"What can I do to improve the students' ability to communicate their understanding and thought processes related to mathematics?"

What is important?
From looking at the school results from last year's grade six testing, there was an overall weakness in students' ability to communicate understanding in mathematics. Students are expected to do the following when solving a math problem: tell what they know, tell what they're going to do, then solve the problem using "words, numbers and pictures." They also are expected to clearly describe in writing their thinking and understanding of concepts using appropriate mathematical terminology and symbols. All or some of these expectations may be the cause of poor communication scores on the testing results.

What was your concern? Why were you concerned?
This was the first year that all grade six students were assessed in reading, writing and mathematics. The results were not surprising.

Percentage of students obtaining a level 1 or 2 in the overall level of achievement:

Reading	57%
Writing	49%
Mathematics	74%

The mathematics results had the greatest number of students achieving a level 1 or 2.

I then looked at the results of the specific categories of mathematics.

Percentage of students obtaining a level 1 or 2 in the mathematics skills/knowledge categories are as follows:

Problem Solving	87%
Understanding of Concepts	87%
Application of Mathematical Procedures	74%
Communication of Required Knowledge	87%

Given that, each of these areas involves written responses, thus all of these math results will be negatively influenced by poor written communication.

In addition, I also had the following concerns about the EQAO's standardized testing: the test is based entirely on written responses (no oral communication is assessed by the test); some students have a general lack of interest in performing well on the test; it is a high stress and artificial testing situation for students, in that students are not allowed to receive any assistance from the teacher or others, as they are normally accustomed to receiving; the marking evaluation is not clearly specified to the students, making them unsure of which sections of the test are more important than others.

Process
In order to increase students' performance in communicating understanding, I planned to:

1. Explicitly teach problems solving steps and strategies.
2. Outline evaluation expectations.
3. Teach required math terminology regularly.
4. Allow students a chance to orally communicate and conference.
5. Encourage parental involvement.
6. Offer immediate corrective feedback.
7. Replicate testing circumstances in the classroom.

1. Explicitly teach problems solving steps and strategies.
The students need to expand their approaches to solving problems. I spent two weeks in September teaching strategies. Each day I gave them a problem and asked them to attempt to solve it using a specific strategy (i.e., drawing a picture). With direct guidance, they achieved various levels of

success. For the remainder of the year, I made reference to this list of strategies pasted in the front of their notebooks, whenever they had to solve a problem in mathematics and others of the curriculum, which was almost daily. (Appendix 1) Many students would still not refer to the list, or if they did they claimed that they still, *"don't understand how to do this."* I asked them to select and try a strategy and if it didn't work, move onto another one. I remember writing in my journal, that they have limited deductive reasoning skills and are not risk takers. " They did demonstrate the ambition to try to improve.

Students not only need to know how to solve a problem, but they also need to know the importance of explaining how they got their answer. I have explained to students that just getting the 'right answer' is a level 2. Only by explaining how the problem was solved will it be a level 3 response. The EQAO testing uses the phrase, "numbers, words and pictures." I have asked students to do this repeatedly. I also gave the students a sheet that was given to me in our action research information, "Steps for Math Problems Solving." It lists six steps for an: 'Awesome Answer'.

1. Tell what you know.
2. Tell what you're going to do.
3. Do it.
4. Give all details – words, numbers and pictures.
5. Give a sentence with your answer.
6. Use your math checklist to make sure you have an 'awesome answer...'

Each of these sections I have reviewed over and over again. Also, students have this sheet in their journals, handy to use. I remind them to take the sheet out and go through it each time.

2. Outline evaluation expectations.

In the past, I had never given much emphasis to teaching students how to communicate in the written form, their mathematical thinking processes and problem solving strategies. I believed that if they could solve it, they should be able to tell how they solved it. Stud3nts need to "buy into" the importance of written communication in the testing setting (and the importance of this skill in everyday life). One way was to explain how they will receive a reading score on the testing. I know now that students need guidance and instruction, and more important, corrective feedback on how to express their knowledge. I do believe that students need to improve their understanding of mathematical concepts and problems solving skills, however, I also think that student shave a great deal of knowledge that is not demonstrated on the testing. I decided to spend time teaching the student what is expected. I used the exemplars from the grade six test last year. I projected the various levels up on the overhead and we discussed what characteristics they felt were positive. The students were then given their booklets from last year and they re-read and assessed themselves. We compared these results to their actual score. The response of the grade seven class was black looks and lack of interest. As far as they were concerned,

That was last year." Sam, a grade 7 student.

> *"Who cares about this stuff?" I didn't do my best on the tests because I knew it wouldn't affect my marks and I just wanted to get done."* Kellan, a grade 7 student, *"I got the answer."*

It was very frustrating trying to show them the expectations.

On numerous occasions, as we did problem solving in groups, as a whole or while taking up answers, I modeled the levels and explained what it was that took the answer to the next level.

3. Teach required math terminology regularly.

In order for students to effectively communicate their understanding in math, they need to be using the proper terminology. I have students record all math definitions we come across in our lessons n their math books for easy reference. It is important to review these terms and formulas regularly in context and meaningful activities. Finding similarities and differences in math concepts helps solidify their understanding. For example, when discussing volume I asked students what other math concepts was similar to volume in meaning the space inside. We concluded that area was similar. WE discussed how the two terms were different. I used base ten cubes to illustrate linear measure (perimeter), area, and perimeter. I also emphasized the units and how they relate to the mode and the dimension

Terminology was also posted on examples around the room for reference at any needed time.

4. Allow students a chance to orally communicate and conference (following the steps of the writing process), write a draft, peer conference, revise and edit and then gradually remove the dependence on peers.

I began by having students use the entire writing process to write a "How to.." paragraph, explaining how to make a peanut butter sandwich, ride a bicycle, or tie a shoelace. I emphasized the necessity of using correct terminology and explaining fully, assuming that the reader knows absolutely nothing g about the topic. They did well with the peer conferencing as they were critical and helped each other see the assumptions that they had made. We discussed this exercise in light of writing mathematical explanations.

I allowed students the opportunity to work in groups to solve mathematical problems. I asked them tot orally share with a partner how they solved the problems. After the students had individually written their responses, I had them switch journals with a partner. I asked them to read the response and discuss with the author the clarity in their explanation. I asked them to ask themselves, *"Could I replicate this procedure and get the same result?"* or *"Does explanation make sense?"* depending on the type of question. Students were then given an opportunity to revise their own work.

The students had greater success orally communicating than they did in writing.

5. Encourage parental involvement.

Parents receive a monthly newsletter to inform them of the curriculum expectations and content for the current month. They have been encouraged to ask their child to explain to them how they have acquired answers in mathematics and how they have completed simple tasks. They have been encouraged to listen for details, sequential steps, and correct use of terminology.

The Next Step comment on report cards offer ideas for parents to use to assist their child as they strive to achieve a higher level of academic excellence.

Parents, even those who asked for suggestions to assist their children, are not

taking the time to ask their students to explain to them the process. Some parents feel that they can't help them because they *"don't understand the math of today."* I've explained that they *"are helping their child to reinforce their understanding and they themselves might learn at the same time."*

6. Offer immediate corrective feedback.

After attending the conference with Ruth Sutton, I was reminded that students need feedback to improve. It needs to be immediate, instructive, and formative so that the students have ample opportunities to improve before they area assessed in a summative manner. I attempted to give students feedback on how they could improve their responses. I did a great deal of this orally, through conferencing, while at other times I wrote responses in their journals. Some students were receptive to the advice and responsive (generally the females), while others demonstrated no effort to incorporate these suggestions.

7. Replicate testing circumstances in the classroom.

Students need to be prepared to answer questions independently. I n test situations they were asked to "explain, using words, pictures, and diagrams." I also gave them one of the test questions from last year's grade six booklet (not one that I had reviewed in class), and asked them to redo it. I observed that students actually did write how they solved the problem, which was an improvement form the blank test papers from last year. The results were better in approximately fifty percent of the tests, but there were still only two level fours. There were twelve level threes out of a class of twenty-six. Some students still wrote explanations like,

> *"I asked the teacher for help"* Allen, a grade seven students

What evidence and data did I produce to who my actions and their impact?

What evidence am I looking for that will indicate my success with changes I make? The results of the grade nine test that these grade seven students complete in two years from now will only be a true indicator of the success of the program if the teachers they have over the next two years continue the teaching strategies. According to Ruth Sutton, the results of standardized tests cannot be evaluated based on one year. A collection of three years of data is required to identify a pattern.

Reflections

If I had not participated in action research, I would not have focused on communicating mathematical procedures with my grade seven class this year. I believe that by grade seven they have a mind-set on how math is to be done and changing that is a lot of work.

Action research gave me an opportunity to expand my evaluation processes. In order to keep a record of students' oral conversations, I videotaped the student working in groups explaining how they solve the problems. I walked around and asked prompting questions (i.e., *"Why did you do that?"),* while taping. I found this difficult as students were continually saying things like *"I don't get it"*, and *"What do we do?"* When I viewed the tape later, I was able to listen to my questioning strategies and encouragement of students and could see directly how they were responding to my advice.

As a result of Ruth Sutton's conference, I have improved my personal practice of using corrective feedback and allowing students opportunities to improve. I give students praise for the positive aspects of their responses as well as offering

suggestions own how to improve. I found this approach advantageous while writing strengths, weaknesses, and next steps for report cards. This formative evaluation is a positive approach because the level one attempts are in pencil and can be improved before the summative evaluation. I actually heard a student say the other day,

> *"Hey, I'm a three now."*, Holly, a grade seven girl.

Upon reflection of this experience, I am looking forward with anticipation to incorporating ideas into my teaching practice.

I plan to include more problem solving in my math program. I definitely will begin the year reviewing problems solving strategies. I will begin early to help students feel confident and comfortable about math.

I believe that mathematics and language, particularly at the beginning go the year, should be taught simultaneously. If students improve their written communications skills in language, then we can work on their mathematical skills in math (with only the teachers knowing the barriers on time.).

I believe that parents need to take more responsibility to help students achieve success at school. I am not totally certain how this can be accomplished, but I have some ideas that I would like to try. If students begin doing problem solving with parents at home in the primary grades, and continue this practice throughout the junior grades, perhaps the attitudes and interest of the students and parents will be more positive.

In conclusion, I believe the biggest difference in my teacher practice is assessing the students in a more formative manner. Rather than conclude that hey "don't get it", and include it as a weakness on their report card, I continue to help them, offer feedback and provide further opportunities to improve their results, before the summative evaluation of the report card.

Fran Lainson, GEDSB, May 2001
PC Concepts 10/01

Improving Students' Communication in Mathematics

George Neeb

George Neeb
Grade 6 Teacher
North Ward School

George Neeb currently teaches Grade 6 at North Ward Public School in Paris, Ontario. This is his third year at North Ward, but his 12th year of teaching.

George has a Bachelor of Arts degree in Psychology from McMaster University and completed his Bachelor of Education at Western University, after which he earned his Masters of Arts in Teaching at McMaster in 1997.

He has participated in two Action Research projects - one involving improving students' communication in math and presently, a project involving students keeping electronic portfolios. He continues to work toward improving student communication in mathematics, and strives to include corrective feedback strategies in all areas of his program.

George and his wife have three young sons, aged 4 years, 2 years and 7 months.

Abstract:

Developed strategies to improve students' written communication in mathematics at the grade six level as a result of Provincial Assessment scores. Found improvement in student confidence and enthusiasm because of corrective action (conferencing, models and checklists, formative assessment), and improvement in written communication in math. Students were taught self-assessment (steps for math problem solving) to increase independence.

My research question was:

"What can I do to improve students' written communication in mathematics?"

Introduction:
I was concerned when the students at my school obtained the lowest results in the mathematics section on 1998-99's Grade Six Provincial Assessment. Upon analysis of the sub tasks, I found that one of the poorest results was the students' ability to communicate understanding in mathematics.

1998-99 Mathematics Results
Percentage of Students Achieving a Level 3 or 4

Problem Solving	13 %
Understanding Concepts	13 %
Application of Mathematical Procedures	26 %
Communication of Required Knowledge	13 %

Although problem solving and understanding of concepts were also weak, I concentrated on communication because it is embedded in all the scores. I was also concerned that, because the provincial assessment is written, students who have trouble with writing are not being assessed accurately on their mathematical ability. Most of my students are stronger orally and the test demands high levels of writing to explain reasoning,.

"It is easier to say it verbally. In math I can never think of what to write." (Student)

Process Writing to Solve Math Problems
In the past, I had never thought of written math responses as needing the time and dedication of language skills. I felt students should just write a response and move on, without really thinking of ways to teach them to do so. I do believe that students need to improve their understanding of math concepts, but I also believe students have much knowledge that is already there but not showing up in the test results. Students need practice and encouragement in sharing in the written form. I decided I would try to teach students to write math responses the way I teach them in Language using a writing process. In essence I borrowed a "Language" technique to apply to mathematics. Really this strategy is a form of integration on my part.

Methodology
Under the guidance of Diane Morgan, Educational Consultant and James Ellsworth, Curriculum co-ordinator, and as part of an action research group, I studied by classroom practice during 1999-2000. Data collection included student work samples, EQAO test scores and sub-tasks, regular journal keeping, videotaping and class lessons. We were trained by Educational Consultant Ruth Sutton to use corrective feedback. With the support of Diane, James and critical friends in the group, I analyzed and shared my learning.

Procedure
I planned to develop ways to improve writing by coaching students to build on knowledge that was already there and use their oral ability as a starting point to written responses. I planned to motivate students and encourage them to help each other to feel more confident about writing the provincial assessment. This would be

accomplished through the following strategies:

- use a process writing approach to solving math problems
- use corrective feedback (Sutton, 1997) with students
- explicitly teach problem-solving steps and strategies
- clearly outline evaluation expectations
- teach the required math terminology
- replicated testing circumstances in the classroom

Commonly in my practice, I encourage them to talk over ideas with others (like prewriting), then write a response using a problem-solving model (drafting), then re-read their response (proofing), share their response with others (conferencing and corrective feedback), and finally, make any changes in ideas and edit for clarity (final draft). I encouraged students to do more than one draft of their responses; just like authors do several drafts of stories.

> ***"Conferencing with others about my math answers helped me to notice my mistakes and help others."*** (Student)

Corrective Feedback

Although students were using corrective feedback (Sutton, 1997) in their conferences, I think it is still important to discuss it directly here. Students need to be taught how to help others improve their work and teachers need to understand the importance of this skill and how to use it effectively. I taught students to focus on making two statements to the writer: ***"You did well...."*** and ***"You could improve your answer by...."*** I reinforced repeatedly that telling someone their work was "good" or "excellent" really does not help them. Everyone can improve in some way. I would always have my students use a conferencing sheet to evaluate how well the stories they were sharing met certain requirements. Students had to staple this formative evaluation onto their stories when they handed in drafts for me to read and I encouraged them to use this feedback to revise their stories before handing them in. I thought this sheet would work for math responses so I had the class help me decide what we should look for in a question. They came up with suggestions and, over time, we realized there was a standard practice to writing a complete math response.

Problem-Solving

Then I found an actual "Steps for Math Problem Solving" GEDSB document, which we used as a basis for our model, conferencing and feedback form. These were the steps:

1. Tell what you know
2. Tell what you're going to do
3. Solve it
4. Give all details – words, numbers and pictures
5. Give a sentence with your answer
6. Use your Math Checklist (found below) to make sure you have an...
   AWESOME ANSWER!

Explicit Evaluation and Practice Tests

Students need to know how their responses are being evaluated. In class, I always have rubrics ready before the students start on an assignment so they know what I am looking for in a Level 3 or 4 answer. Using the overhead, I showed students the actual rubrics for the provincial tests. Although the rubrics are very general, we had a lengthy discussion on what each section meant. When we took up the practice tests together, I modelled responses based on the rubrics sent by EQAO and clearly identified why I was doing what I was doing in the response.

Findings and Conclusions

Students need to buy into the importance of written communication in the test setting (and the importance of the skill in everyday life). One way was to leave mathematics and discuss the reading section of the provincial test. I asked students to explain how they thought they would receive a reading score. Most assumed they would be reading to someone. I explained that their reading score was based on the writing they did about the story they read, the reasons why we have been doing response journals all year! This helped them see that writing was clearly important.

Students need to be prepared to answer questions independently. It is important for them to realize that they will not have the corrective feedback they had in the classroom on the provincial test. In the third term, I gradually removed the conferencing option so students would solve the problems more independently.

Student Response

Students greeted the writing process approach to math with enthusiasm. The class was unanimous in agreeing this not only made math journalising more fun but it actually did help their mathematical understanding. A few said it helped them to clarify their ideas and make their responses better.

> ***"I liked conferencing with others about my math answers because I got to see what other people thought of my work before I handed it in."*** (Student)

Summative Evaluations

Even if the conferencing and sharing only made math more enjoyable, it was still a help because I believe the more enjoyable the experience, the more effort will be put into it.

My own practice of corrective feedback to students has improved this year. I feel more confident giving students' strengths, weaknesses, and next steps comments with marks being optional. This formative approach helps students see how they can improve as opposed to just receiving a mark and ignoring the comments. I still use summative evaluation but with corrective feedback in mind and I give students opportunities to improve their work after they have received the feedback.

In working independently in third term, I found many students still did as well in their responses because they could conference alone, using the corrective feedback ideas discussed in class. Students were re-reading their responses, going through the "Steps for Math Problem-Solving" independently and also revising and editing. Some were even doing second drafts.

I videotaped students hard at work and conferencing, using the camera as my eyes. Usually I was quiet - just observing, sometimes asking questions. This gave me a wealth of information about my students. When I viewed the tapes later, I found I was seeing things I had not noticed (who was working with whom, who was more on task, who was giving helpful advice). I could also listen to my own questioning and see how students were responding to me. I then showed the video to them. This offered us a process for formative student self-evaluation, teacher-student evaluation, and teacher self-evaluation.

I have seen incredible growth in my students' mathematical communication. We still have a distance to go, but I believe I have implemented some techniques to help students that will become part of our everyday classroom programming

I had students give feedback on math this year. They made some powerful statements about their own learning:

"Problem-solving is my favourite part of math because it is both fun and challenging."

"I find it easier if I have discussed the problem rather than having to do everything in my head."

"I have improved in problem-solving. When I first started I was bad at it. Now it's my favourite part of math. I don't know how I improved, I just did."

Our school results are in from last year's Provincial Assessment. I have only analyzed the data from the Grade six students that I taught last year. I have compared the data to the previous year's scores (mentioned above - none of these students I taught). I am happy to report an increase in communication (and all mathematical scores).

Comparison of Mathematics Results
Percentage of Students Achieving a Level 3 or 4

	1998-99	1999-00
Problem Solving	**13 %**	**34 %**
Understanding Concepts	**13 %**	**26 %**
Application of Mathematical Procedures	**26 %**	**46 %**
Communication of Required Knowledge	**13 %**	**25 %**

Reference

Sutton, R. (1997) The Learning School. Salford: RS Publications

Concluding Comments

I am continuing my research during 2000-2001, again with the support of James Ellsworth to see if I can sustain my learning and continue to improve student learning and achievement. I am presenting my research at the Ontario Educational Research Conference in December 2001.

This article first appeared on the Ontario Action Researcher at: www.unipissing.ca/oar

George Neeb, GEDSB, May 2001

Supporting Teachers: Listen and Learn

Janet Rubas

Janet Rubas
Teacher Consultant
HEF Teacher Resource Centre

Janet Rubas is currently a Teacher Consultant in the Junior Division. She has earned a B.A. and an M.A. in Political Science at the University of Illinois, and achieved her Bachelor of Education at the Ontario Teacher Education Centre in Hamilton. She is using EQAO results to improve student learning and to help in the creation of a 'Culture of Assessment' in a school.

The role of Teacher Consultant is one of influence rather than power. To be most effective in the role one must influence teachers to make changes to their own practice in order to improve learning for the students in the classroom. This study examines how one teacher consultant improved her performance by putting herself in, what Ruth Sutton calls, a "continuous feedback loop." Through seeking feedback, listening to, recording, and reflecting on teachers' concerns and ideas the teacher consultant was able to implement projects that supported both teacher and student learning. Through this study, the manner in which she does her job has changed for the better.

Action Research is self-reflection. To reflect on one's practice requires an understanding of what one believes. As a teacher, I strongly believe that all students can and should be successful in the academic setting; that what teachers implement in and for the classroom is the key for student success; and that I, above all else, am a learner myself. These are my beliefs.

I have been a teacher consultant for five years and I am very proud of what I do and have accomplished in this position. I acknowledge that the position of teacher consultant is truly secondary to the position of teacher. Teachers are the 'front line workers' who interact with children on a daily basis and whose interactions lead to student success. As a teacher consultant I

can only support what is happening in the classroom. I might be more knowledgeable about current research; I might better understand the directives from the Ministry of Education; I might have time that can be devoted to reading and planning. However, what I do in my position affects students only indirectly. Although the position I hold exists to improve student learning, I can do that only by my support, influence, encouragement and, perhaps, inspiration of teachers. How I, personally, do that influences how effective I am in my job. My performance must be evaluated on how much that performance assists teachers to develop the knowledge and skills necessary to make changes in their practice that will improve students' learning.

I, then, am in a bind. My position exists to improve student learning. Every position in education exists for that basic, intrinsic, absolute reason; we exist because and for the students. However, I do not come in direct contact with those for whom I am working. My action research question must be directed inward: How do I improve my performance so that I can support those directly involved in the classroom with improving student learning, the teachers, to build the knowledge and skills necessary to help students to be more successful? If I can get better at supporting, influencing and encouraging teachers to broaden their strategies for teaching and assessment, the benefits should be realized in improved student learning. Teachers must provide the evidence which shows that their practice is changing, resulting in improved students learning, and those changes were influenced by work with them. My performance is improving if what I am doing is making a difference to students in the classroom.

In the beginning...

When I started this action research project, I fell into the 'all too common' trap that, as a teacher consultant, I could and should 'fix things.' I had the skills, the ideas, and the knowledge to improve our district's results on the EQAO assessment. The answer was clear! All I needed to do was to develop 'the culture of assessment'; get teachers to accept that the EQAO assessment results as "friendly data" that should be used to improve student learning. I started with the research question: How do I improve my practise in supporting teachers so they accept assessment as a tool to improve learning for students? The assessment I was focussing on was the EQAO results. My improvement depended on teachers changing their attitudes and then changing their practise based on the change of attitude. From my point of view, the results would get better if teachers would just analyze the results, get ideas on what needed to improve, decide what strategies would lead to improvement, focus on those strategies, and collect data on how students were improving. What was the big deal? The EQAO assessments were just one more piece that teachers could use to be more effective in improving student learning.

In sessions with teachers of Grade 3 and Grade 6, however, I learned that teachers had a much different view of the province-wide assessment. Although I considered the results as simply one piece in the assessment puzzle, this certainly was not the perception from the field. Instead teachers said:

> *"Advances are made by those with at least a touch of irrational confidence in what they can do."*
> **~ Joan L. Curcio, author ~**

- "The tests are designed to compare schools and teachers."
- "The tests don't reflect what is really important and what is happening in the classroom."
- "The tests were set up to ensure that students ended up at level 1 and 2 to make the teachers look bad."
- "The whole procedure is just political."

It was as if teachers and I were speaking two languages. They were looking at the assessments from a different point of view, from the experience of the four walls of the classroom. They were 'close' to the situation and, in many cases, felt as if they were being held responsible for poor results. They were not viewing the results as a way to improve student learning but as a way for the government, the public, and parents to determine if they were good teachers. In a time when there is so much change, teachers already were feeling less than confident. 'Just get the tests over with...' was a common reaction. Given that many of the schools with which I came in contact had relatively poor scores, the perception that the tests could be helpful was a frightening and foreign idea.

As I listened to teachers talking about the frustration and self-doubt that came from the testing situations, it was clear to me that just telling teachers that the data was 'friendly' or giving them suggestions as to how they might 'fix' the test scores would never work. If the scores were going to improve, teachers had to be intrinsically involved in the process in order for them to focus on what the scores told them that their own students needed. They had to learn how to put the testing into the context of their classrooms, connect the data to what they were doing, and make changes to their own practice based on that analysis.

It was evident that I had to change how I worked with teachers in order for this to happen. I could not just tell them what to do, I had to wait and listen while they analyzed the data, developed their own explanations, and determined, for themselves, where to concentrate effort.

A Step in the Right Direction...

It was clear to me that the aim of my research had to change. I must focus on improving my own performance and through that improvement, hope to change the attitudes of others. I had to concentrate on what I could and would do differently. After a session with Ruth Sutton and a discussion of the concept of 'corrective feedback', I realized that I was the one who required feedback from teachers on what I was doing, how I assisted or failed to assist them, and what I needed to do differently to help them make changes. In the past, I received feedback in a written form which usually gave teachers the opportunity to say what they found useful in a workshop session. In most cases these written reflections were positive. When negative comments were made, more often they were directed not toward the content but at the organization of the sessions: e.g. "I am too tired for workshops at 4:00 p.m." or, "there was no tea available." It was clear to me that this was not the kind of feedback I was seeking. I needed direct communication; look the teachers in the eye and ask, *"How have I helped you?" "What could I do better?"*

Now, at first, the prospect of doing this was really scary for me. Yes, I am a confident individual, at least related to my job. However, I was opening myself up to real criticism. I was opening myself up to being told exactly what I did wrong. Would this really help to improve my performance? I realized, however, that if all data is 'friendly' and I was trying to model a 'culture of assessment' where feedback and assessment data are used for improvement, then the benefits of opening myself up to criticism outweighed the fact that my ego might take a beating. I was going to start modelling for teachers what I believe is necessary for them to do with data from and about their students and their own performance; collect the data, review and analyze it, determine what the data provides as to clues for improvement, develop a course of action to

implement that improvement, try it (test it out), gather more data (assess), and start all over again. I was going to try to put myself in a continuous feedback loop.

A Few More Steps...
It was clear what I had to do. I needed to provide opportunities for teachers to give me direct feedback on my performance so that I could use it to improve. It was necessary for me to build into each of the contacts I had with teachers a commitment from them to connect again for a review not only of my performance but also the results of the contact. It was also necessary to make sure that any follow-up session did not add to teachers already heavy load. I needed to find a way to get the feedback without making them stay after school or requiring them to answer questions on a survey during their own time.

Through this year I have used three basic methods for collecting 'corrective feedback' on my performance:

1. **Let's talk over lunch** - Discuss with the principal the possibility of bringing lunch for the staff and reviewing what had been done in a working session a month or two before. If this meets with the principal's approval, determine a date and order lunch. (Don't forget to ask if the staff have any allergies or food restrictions.) Arrange that staff members will bring 'evidence' of using what we had created or worked on in the previous session. Make it very clear that the evidence was not to assess the teachers' performance, but mine.

   Benefits: Teachers feel special, are relaxed, and are quite willing to share. An additional benefit is that one can meet with the whole staff at the same time.

   Problems: Lunch supervision schedule may put principals in a difficult situation for coverage. However, if the purposes of the discussion over lunch are clear, staff members can drop in to eat and share their feedback when their supervision duties are over.

2. **Release Time Discussion** - Arrange with the principal for a small group of teachers to gather together to give feedback during the day. Principals must be willing to release teachers from their duties (money from my budget allocated for principals to provide occasional teacher coverage) and must also help to schedule the occasional teacher times so that individuals or pairs of teachers can meet with me. Prior to the date, provide the teachers with an outline of what will be discussed during the time set aside so that they are prepared for the discussion. Make sure teachers understand that the feedback is going to be used to improve my performance, not to assess theirs.

   Benefits: Teachers realize this is important (money and time allocated to do it) and are quite willing to share. There is enough time available to review the teachers' feedback, to discuss further actions and improvements, and to get reactions to ideas.

   Problems: Cost involved and budget considerations. Lack of occasional teachers to cover the classes.

3. **Teacher Reflection** - At the start of a small group session, ask teachers to reflect on a number

(no more than 3) of statements or questions that directly relate to what will be covered in the session. Collect these responses. Shortly before the end of the session, ask teachers to reflect again on the same statements or questions. Collect these responses and compare the two. Once again, teachers must be fully aware that the reflections are to be used only to assess my performance and will not be shared with anyone else.

Benefits: Quick and easy.

Problems: Does not give the depth of information that direct discussion provides. Short time lines so that teachers really haven't had the opportunity to use and apply the information in the classroom.

What did I find out ... What did I change...

My focus had now changed. Although I had started trying to gather information on how to help teachers to use assessment data in the classroom, including the data from EQAO, my focus now was directed inward; How will I use feedback to improve my performance as a teacher consultant? Although I have applied the feedback I collected over the year in many different ways, I want to tell two stories that have changed forever the way I do my job.

Early during this academic year, a principal asked me to conduct an after- school session for junior teachers on literacy, assessment, and evaluation. The session was to be small (four teachers) and informal (let the teachers talk and discuss issues). The principal had expressed the concern that the teachers were not using a balanced approach to literacy, focussing instead on one type of reading and response.

As our session progressed, it was evident that the teachers were collecting all kinds of data on the students they were teaching. They all had mark books with 'levels' assigned for numerous pieces of student work.

Our discussion moved towards whether teachers were really getting an insight into what students needed in order to improve. With the principal as part of the discussion, we talked about some of the methods that could be used which might provide more detailed information on what students could do and how they might set goals for improvement, for example; oral reading conferences, student surveys to determine interests related to reading and writing, and portfolio systems. The teachers politely asked questions and made comments.

However, as the discussion went on, I noticed that one of the teachers was becoming more and more upset. She stopped contributing to the discussion and almost physically withdrew from the group, pulling her chair back from the table. The principal did not notice this withdrawal and about then, excused herself to finish some details in the office.

The teacher who had withdrawn came back into the discussion and wanted to share with me and the group the work she was doing related to language. The evidence she shared made it clear that she worked very hard to make sure she was 'accountable.' She examined every expectation, determined how she was going to evaluate how the students were doing on that expectation, and

connected levels of achievement to her planning; what will a level 3 or 2 look like? Her records contained information about every assignment the students completed with levels assigned for each.

When she was through sharing what she had been doing, she looked at me and said, *"I have tremendous respect for both you and (name of principal). I know that you both have many great ideas. Some of those ideas I use all of the time. But when you start talking about other things we can do, like more conferencing or portfolios, I get very upset. - **I just can't do any more!**"*

> *I have plenty of time for assessment; it's the way I teach.*
> **~ Anne Davies, Ph.D. ~**

This heartfelt statement and direct feedback about what was being discussed in our session gave me the most important insight into how I could improve my performance. It is absolutely necessary that I, as a support to teachers, never be seen as adding more to their jobs. I must help teachers reflect on what can and should be replaced in the way they are working. Never add more, find a better way.

Since that experience, I include in every workshop that I do with teachers and every consultation with principals, a discussion of how to determine what is expendable; what will this new idea or procedure take the place of; and, how will the idea make work in the classroom with students better?

This experience pointed out to me that I must listen and learn from teachers. It doesn't matter what I intended (I never meant for teachers to take on more), what teachers perceive can be quite different. If I don't ask and do not allow myself to be open to what they are saying in both words and through body language, what was intended and what actually occurs might never match. It is not unlike the classroom situation. We can teach all kinds of concepts and skills but if we do not listen to and observe what children say or show what they have learned from that lesson, we can never be sure that what we intended to be the outcome actually was the result.

My second story involves my work in helping teachers learn the Ontario Curriculum Unit Planner. The principal of a school asked that I introduce the tool to a portion of the staff who would then, in turn, share the tool with their colleagues. Four teachers met with me in a whole day training session in which the planning model was introduced and then the teachers worked in pairs to plan a unit using the Curriculum Planner.

This is the basic model for introducing the Planner that I had been using throughout the year. Rather than just talking about the tool I always felt it was necessary that teachers employ it for planning a unit that they might use in their classrooms. When groups came to me, they were to already have an idea of the expectations that would be addressed in the unit they would plan in our session.

In this case, the teachers met with me, we worked to understand the planning model, and then, they planned their units (as much as was possible in the day) as we worked through understanding how to navigate through the Planner.

About one month after our planning session, I arranged with the principal for her to release the teachers for the morning so that they could provide me with feedback on our work together. The feedback provided me with a number of interesting insights;

- All of the teachers thought the Planner was a very interesting tool that provided helpful information for teachers.
- Few believed that the Planner would be used readily by teachers to write units. The time necessary to write a unit was just not available.
- All believed there were some elements in the Planner that would provide teachers with time-saving tools (e.g. the rubric maker).
- Neither of the pairs of writers had finished, or even worked on, the unit they had begun in our training session.

This feedback was quite a bit different than what I had expected to receive. Foolishly, I thought I was introducing the Planner in such a way that teachers would find it an indispensable tool. Once again, I was seeing the Planner from my perspective and not from the perspective of the classroom teacher. I could see all the possibilities that the Planner would provide. However, without the time to use it and learn it, teachers would only skim the surface of what it could do. Just skimming the surface would not give them the commitment or insight needed to go back and use it. And, using the Planner is the only way to find out how much help it can be.

So, how do I change my performance to help teachers understand the 'power' of the Planner better so that they might commit to using it on their own. Based on the feedback I received from these teachers, I sat down and started to think about what would encourage teachers to go back and use the Planner. I decided three things:

1. Teachers had to walk away from the training session with a unit that was complete enough to be useable in their classrooms. The unit had to be in the electronic format, rather than in a hard copy, so that teachers would have to access the Planner themselves in order to get the unit.
2. Teachers had to be shown how units that were already completed in the Planner could be found and copied so they might be changed to better suit the teachers' own classroom and grade. Teachers had to be shown that one could plan a unit without having to write much at all.
3. Teachers had to learn how to access elements of the Planner without having to write units. Teachers need to be made aware of elements like the Teacher Companions with information on numerous teaching/learning strategies, assessment techniques, and accommodations for various exceptionalities or the rubric maker which easily accesses the achievement level descriptors.

On the basis of these thoughts, I have developed a new training session that I now use with teachers and have shared with other teacher consultants to use in their training workshops on the Planner. In this session, the unit we work on is 'almost' complete. Teachers write only one of the subtasks. All of the others have already been finished, so that when the workshop concludes, teachers walk away with a unit that can be used in the classroom. Through the session, teachers are introduced to those elements that will be most helpful to them in using the Planner as a

resource for planning a unit on their own. They are shown how and encouraged to copy subtasks, resources, and information from the Teacher Companions They are shown how to easily access expectations, achievement level descriptors, and lists of accommodations. They gain experience in using the rubric-maker.

The feedback I am receiving using this new model is very positive. One principal said, "I learned more about the Planner in two and a half hours with you than I did in three separate workshops given by the Ministry of Education." A teacher commented, 'The unit we planned was great but even more important, I learned how to use the Planner for more than unit writing... I learned how it will make my job more manageable so I can spend less time writing rubrics, for example, and more time working with the students."

Back to the beginning...
My action research question was and continues to be: How do I improve my performance so that I can support those directly involved in the classroom with improving student learning, the teachers, to build the knowledge and skills necessary to help students to be more successful? I have learned through this research that I must listen carefully to teachers in order to support them. In most cases they know what they need. This does not mean that I only present "what they want to hear." It does mean, however, that no matter what information or skill we are working on, I must take time to find out how the ideas presented were used or not used in the classroom. I need to plan what I do and what supports I provide, based on what teachers tell me is making a difference in what they do in the classroom. I know that I have changed the way I work in this position for the better.

This understanding will continue to improve my performance. I will forever be in a continuous feedback loop because I have learned that by seeking feedback, and acting on the feedback, not only do I provide better support to teachers, I also model the assessment practice I believe teachers must implement in the classroom to enhance student learning.....

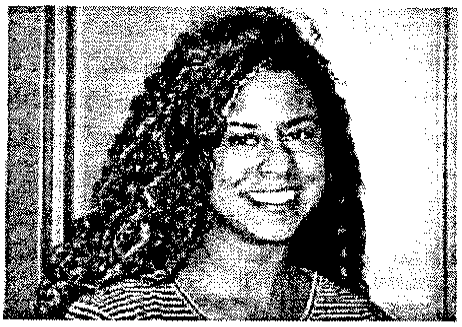
Listen and learn.

Janet Rubas, GEDSB, 2000
PC Concepts 11/01

How to Improve Student Performance With A Focus on Math

By Fostering Positive Self-Esteem and Creating Awareness of Gender Issues

Liana Thompson



Liana Thompson
Teacher Consultant/Learning Resource Teacher

Liana Thompson is currently a Teacher Consultant in Special Education and a Learning Resource Teacher for students in Kindergarten to grade six at the Simcoe School Support Cenrte.

She achieved an honours B.A from McMaster University and her Teacher Certification, Special Education Specialists from Medaille College in New York.

Liana's areas of interest include world travel, languages and mathematics, special education and counselling psychology, action research

ABSTRACT

At the time I began action research, I was a 0.5 Grade 7 classroom teacher, teaching math, science, health, and art and 0.5 Learning Resource Teacher for the school. I enjoyed teaching my Grade 7 students, particularly mathematics. I found both the girls and boys worked hard to achieve good grades and the discussions during math period were equally dominated by the girls and the boys. For the most part, everyone seemed to express some interest in math.

It came as a great surprise to me when reading the results of the EQAO provincial test scores that, although the girls had achieved more level threes and fours than the boys in the mathematics subtest,

the girls viewed themselves as weaker math students and displayed a general dislike of the subject overall. This discrepancy gave rise to my research, as I felt the need to develop strategies for both the boys and girls in my classroom that would foster a positive attitude towards math and develop confidence in their abilities to meet with success in this subject.

WHAT IS THE QUESTION?

WHY IS IT IMPORTANT?

School Profile

Opening a new school is a tremendous task. The time, effort, and commitment of the staff, students, and parents is always to be commended. At times the most obvious yet crucial roadblocks to student learning can be overlooked, primarily due to lack of knowledge about the general attitudes and perceptions of the student body.

Lynndale Heights Public School is located in Simcoe, Ontario, a town with an approximate population of 15 000. The school provides services for Junior-Kindergarten to Grade Eight classrooms. The student body of 260 individuals was formed from five philosophically different feeder schools. Lynndale is located in a quiet subdivision that had been originally designed to accommodate families from all social classes. The student population reflects this diversity. Academic achievement, behaviour, and attitude vary significantly with family support.

Our Action Research Project

Diane Clark, the Grade 6 teacher and myself, who teaches Grade 7 and Resource K-8, were interested in the results of the 1998-1999 EQAO Provincial Assessment Results for Grade 6. Diane had taught 27 of the 42 students the previous year and I was now teaching 15 of the 42.

It came to our immediate attention, after reviewing the results, that a conspicuous difference was displayed between male and female attitudes towards math. The percentage of girls who said they liked math was 33, as compared to the boys 73%. Also, the difference in attitude between males and females when asked if they were good at math was pronounced - girls 33% and boys 80% (Appendix 1.). What held the greatest impact were the factual results when concrete test scores were tallied for achievement levels. Looking only at Level 3 results in all the math strands, 11 out of 14 girls (79%) were working at this level, as compared to 10 out of 14 boys (71%). Upon further perusal, we found that once again girls achieved Level 4 scores on a more consistent basis than the boys (Appendix 2.). After some discussion, we noted that student perception about mathematics was not indicative of actual performance, particularly in the case of female pupils. Accordingly, we decided to conduct some research around the question,

"What is the stimulus to foster positive attitudes for girls towards the importance of math and science in their lives?"

Because math and science are linked so closely in the provincial curriculum, we decided to include science in our research, assuming that as we progressed we would discover similar perceptual differences towards science among boys and girls in our classrooms.

WHAT DATA WAS COLLECTED?

Formative Assessment

In order to show evidence around the felt need and to legitimize our research, we began by discussing the Grade 6 attitudes survey results with our staff members. It was agreed upon that a need for further research was appropriate. It was decided that TAG groups, which consist of grade six, seven, and eight students, would be reorganized into single gender groupings for the purposes of our research until further notice. Diane and I chose girl groupings. All students were given a teacher compiled math questionnaire to be completed during one full TAG session, with the assurance of confidentiality (Appendix 3.) They were asked to answer every question and to be completely honest. After questionnaires were completed and conclusions were recorded (Appendix 4.), we scanned report card marks from the first term to determine actual student performance.

The results of the questionnaire combined with first term report card marks corresponded to the provincial results. Once again we found that female perception towards mathematics was very poor even though performance was good, if not excellent. We also found that boys perceived themselves to be strong math students, who enjoyed the problem solving challenges even though success was moderate when compared to the girls. We assembled the qualitative data for easy reference (Appendix 5 and 5a.)

The need for some action had been established. At the next TAG session we discussed the Grade 6 survey questions and asked the students to predict response percentages for each. I had assumed most girls would predict low percentages for female responses, but it was a surprise to find that

they accurately anticipated the boys' high percentage of positive responses. When asked why they assumed the boys would respond so favourably to these questions, the answer was, "boys think they're great", "they have huge egos", and "they think they can do anything". I then prompted the girls to explain why girls feel so negatively towards math in general. The overall response was "it's boring", "it's too hard", and "what will we use it for in the future anyway?" I showed the girls the overhead of the provincial survey results and they smiled, feeling quite satisfied that they had predicted correctly. I continued the discussion by providing the overall summary of actual performance on the test and this surprised them. They were quite shocked to learn that the girls had out-performed the boys on the math section of the test. I then posed the question, "Why do girls have such a negative attitude towards math?" None could give me an answer.

I began to realize the all-encompassing, societal and cultural basis for the discrepancies in student attitudes towards mathematics. The girls themselves did not know why they didn't like math, or why they felt they did poorly in math. Upon reflection, I realized that in interviews parents, especially mothers, often complained that they couldn't help their child with math homework because it was "never a strong subject" for them. The project that we were undertaking seemed to balloon and become overwhelming at this point. I realized that not only student attitudes had to change, societal attitudes needed adjustment as well.

WHAT WAS DONE?

WHAT WAS FOUND OUT?

Corrective Feedback - Part 1

Following the feedback - feedforward philosophy, Diane and I began to plan ways in which to foster a more positive attitude towards math among our female students. Our topic question was changing in that we decided to omit any focus on science at this time. It would just be too great an undertaking. The question became,

> ***"What measures can be taken in the classroom in order to foster positive self-esteem among female students in order to improve math marks?"***

The single-gender TAG group became an implemental part in our ability to carry out our research. During TAG, discussions were held about test scores, self-esteem, traditional and non-traditional career opportunities for males and females, and the classroom environment. Some female comments regarding provincial and classroom mathematics test scores, "I can't believe we did better than the boys!" and "I'm not good at math because it's boring", in comparison to the common male response to test score results "It was pure luck the girls did better than us. Are you sure someone didn't make a mistake with those scores?"

When the subject of careers and career choices was broached, many girls admitted that they would like to be a lawyer, or a police officer, but felt that these jobs were "mostly for men". To encourage thought expansion regarding job choice, the staff decided to allow students to attend a career fair with their TAG groups at the local high school. Before the fair, I provided the TAG group with a list of traditional and non-traditional careers for men and women. We discussed the list and I asked them to choose three of the careers on the sheet, or add their choice if it wasn't listed, as these were the booths they should try to visit and for which to form questions to ask when they attended the fair. Invariably, the girls chose careers they were interested in and for which they felt they had a natural talent. Many of the boys, however, based their career choices on the following two comments, "I know I can do anything I want in life as long as I try and work hard" and "Just tell me the top five highest paying jobs and then tell me what I need to do to get one of them".

The girls also admitted that self-esteem was generally low for females in their age group (11 - 14) and boys usually were quite confident and self-assured. Many blamed it on the media and it's portrayal of the unattainable "perfect female" in our society, or the myth of the subservient caretaker role model that was often perpetuated on television and in the movies. Others felt that they were taught at home at a very early age, perhaps not intentionally but very subtly, that girls just weren't good at math or science-type projects, but better at English and other languages-based subjects. Still others blamed low self-esteem on the male members of their classrooms, citing incidents of teasing and taunts such as, "what a stupid answer" or feeling very self-conscious that they were acting "smart" thus "not cool" when raising their hands to answer questions. Many girls felt that the boys were just better at math, so it made sense to allow them to "run" math discussion time.

Again, my thoughts began reeling as to just where the actual problem lay. The more we dug, the more I found that low self-esteem in general was causing problems throughout much of the academic success of adolescent girls. Boosting the self-esteem of as many girls as possible seemed to be in order. During TAG I tried to stroke their weakened egos and assure them that they were all strong, interesting people with much to provide to all classroom discussion. I encouraged them to begin to take risks in the classroom by participating more in math, contributing ideas and taking on leadership roles.

Because some improvement in self-concept was noted during the TAG sessions, Diane and I approached the staff and asked them if they would be willing to arrange all classroom group activities into single gender groups for term two. This was agreed upon, and it was interesting to note that female student reactions in the various grades were markedly different. The grade six girls welcomed the chance to feel less stress and more confidence when answering questions without the pressure of a male presence. All-girl groups seemed to be a wonderful prospect. The grade eight girls didn't really respond much to the change verbally, but a slight increase in self-confidence was noted during discussion and brainstorming activities. The grade seven girls, oddly enough, were quite indignant and taken aback when they found that they would be working in single gender groupings for all classroom activities for term two. Comments were made such as "this is going to be boring", "we need the challenge of the boys in our group" and "why are we doing this, because in the real world we'll have to learn to work with boys".

Throughout the second term, observations of classroom atmosphere during group activities were recorded informally by the grade 6, 7, and 8 teachers. At the end of the term a meeting was held to discuss these anecdotal records and academic achievement. Overall, the grade six girls were achieving higher marks in math than they had been previously and their preference for working in single gender groups was evident. They were more confident, self-assured, and routinely bringing in articles to the classroom teacher about gender bias in our society. They were becoming more aware of their capabilities and responding to challenges in their environment. Academically they were improving. The boys in the classroom maintained their self-confidence, but fewer boys achieved level 3 marks in term two than had been the case in term one. The grade eight girls showed much improvement in their self-confidence when working in single gender groups, but academically remained the same. The grade eight boys maintained their self-assurance, but once again marks dropped slightly. Unfortunately, once working in a whole class environment, the steps taken towards risk-taking behaviour among the girls seemed to be lost, as once again the boys dominated classroom discussion. The self-confidence and academic achievement in grade seven girls seemed to remain the same, while the boys in grade seven weakened slightly academically with no difference noted in their attitudes. The grade seven classrooms were very happy to find that single gender groupings were no longer necessary at the end of term two.

It seemed to be an insurmountable task. How could we expect to change eleven to fourteen years of societal and cultural conditioning in only a few months? And by changing student attitudes at school, did we have any effect on attitudes and beliefs being perpetuated at home that may be contradictory and eventually damaging to the self-esteem of the girls? And just whose attitudes needed to be altered anyway, the girls or the boys?

Corrective Feedback - Part 2

The question was changing again. Self-confidence and gender issues were very tightly intertwined and both were determined greatly by societal and cultural factors, not school lessons. It seemed imperative that both needed to be addressed before improvements could be made in academic achievement for boys or girls.

I realized the need for teachers, other colleagues, and parents to be made aware of gender stereotypes, sexist language, and other so-called "power" biases that exist in our society and the effect each has on student performance. I chose to modify the question again,

> ***"Will fostering positive self-esteem and creating awareness of gender issues improve student performance, especially in math?"***

It became obvious that staff members and others in the teaching profession needed to be educated on the power of societal beliefs towards gender issues. In order to get a handle on how to approach colleagues effectively, Diane and I spent some time with Bob Ogilvie, Intermediate Teacher Consultant with the Grand Erie District School Board. Acting the role of critical friend, Bob was implemental in helping us to see that we were working in an effective way with staff members by discussing our research, asking them to take part whenever possible, and asking for their feedback. He made the point that we didn't want to "overdo it" and be too forceful because this would push attitudes in the opposite direction. We encouraged those staff members who were interested to continue to be aware of gender issues in the classroom and strive for equality during classroom discussion, activities, and when assigning "odd jobs". Many girls were now being asked to stack chairs, dig sand pits, and move paper stacks,
while boys were being asked to decorate classroom bulletin boards and to participate in activities that were traditionally thought of as "girl jobs".

We brought our research to the attention of the school community council and the parent group. Again, we didn't push too hard. Awareness of the issues was what we were seeking, knowing that a change in attitude may or may not develop in the future. We provided a list of Christmas gift suggestions parents could draw upon to encourage greater interest in math and science for both boys and girls (Appendix 6.). A bulletin board in the hallway was developed with the title "What Do You Think About Gender Issues?" Students were encouraged to find articles at home on their own or with parents that displayed positive gender attitudes for males and females. Science and math websites to promote interest among teen girls were posted, along with articles about positive female role models in traditionally "male" occupations. An article about International Women's Day around the world also found its way to the bulletin board.

Diane and I participated in the "Act, Reflect, Revise" conference held for those conducting Action Research. We promoted awareness of our topic by presenting our findings to a small group of our peers. We used this opportunity to further our research by asking the participants to complete a set of questions that we had been asking ourselves and found we needed more input than just the two of us could provide (Appendix 7.) The participants were more than willing to share their thoughts and ideas, and we encouraged them to take ideas provoked by our presentation back to their home schools and share them with students, parents, and other colleagues.

HOW WAS PRACTICE MODIFIED?

WHAT ARE THE NEXT STEPS?

Summative Assessment

My practice has been modified in several ways. I always thought I was the most liberal-minded, equal- thinker around, and then one day I caught myself in a big slip-up. On the first day of school, I generated my classroom discipline policy by using the quote "No man is an island". Not until well into my research did it dawn on me what I had done. I quietly changed the word "man" to "person", without announcing what I had done or why I had done it. The students in the classroom noticed immediately and I allowed them to discuss it among themselves briefly. They invariably concluded that "man" was sexist. I knew my goal was being reached.

I am continually providing activities for female students that would previously be considered "male" jobs and vice versa. I encourage all students to find thought provoking stories in the media that are related to gender issues and the breakdown of gender stereotypes. I allow students to choose groupings in which they feel comfortable to take risks. I take care to ensure that I am not using sexist language and ask students to do the same. If they ask why, a class discussion regularly ensues. I discuss my methods with staff members in an informal setting and ask them for feedback and ideas of how I can further promote this awareness.

Our next steps seem limited compared to the vast nature of our question.

1. We have arranged for Bob Ogilvie to come to Lynndale Heights on May 15 to in-service staff about gender issues in society and the classroom.

2. We plan to conduct a "Teen Esteem Lunch" series for the Fall of 2000. Female role models from the community will be asked to spend a lunch hour with female students in grades six, seven, and eight.

3. We hope to enroll several grade eight girls in the 2000 - 2001 class in a program call GIRLS (Growth, Independence, Respect, Leadership, and Self-Esteem). It takes place each spring at Waterford's Camp Trillium.

My research seems to keep growing as time passes. I am certain I will continue to focus on these issues throughout my teaching career and I hope to make many that cross my path as aware and committed to making a positive change in their students and communities. With this change, there is the expectation of higher marks to be attained by all students and an ever-increasing awareness of the equality and the contributions to be made by all individuals in our society.

APPENDICES

Lynndale Heights Public School
Grand Erie Schools - Grade 3, 70 schools with122 classes
- Grade 6, 69 schools with116 classes

	Grade 3		Grade 6	
	Grand Erie	School	Grand Erie	School
Number of students	2124	29	2288	41
In ESL program	1%	0%	0%	0%
Fully Exempt	4%	0%	3%	5%
Receiving Special Ed Support	22%	17%	16%	10%
Boys (some gender not specified)	51%	55%	48%	37%
Girls	48%	45%	49%	44%
Language other than English in the home	3%	0%	1%	5%
English & another language	4%	3%	4%	0%

Attitudes: (% saying yes)	**Grade 3**				**Grade 6**			
	Grand Erie		School		Grand Erie		School	
	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys
I like to read	**81**	**66**	69	81	**68**	**53**	67	67
I am a good reader	**63**	**56**	46	75	**64**	**56**	50	60
I like to write	**69**	**52**	62	50	**58**	**45**	67	67
I am a good writer	**60**	**49**	38	75	**48**	**43**	50	67
I like mathematics	**56**	**60**	62	62	**35**	**51**	33	73
I am good at mathematics	**39**	**53**	38	62	**33**	**52**	33	80
I do reading that is not a part of my work at school	**59**	**48**	69	56	**60**	**45**	61	80
I do writing that is not a part of my work at school	**55**	**46**	62	44	**51**	**37**	67	33
I do mathematics that is not a part of my work at school	**42**	**41**	54	56	**27**	**34**	33	60

Template prepared by J. Rubas, November 1999

	READING						WRITING					MATH						MATH STRANDS				
	Reasoning	Communication	Organization of ideas	Application of Language Conventions	OVERALL ACHIEVEMENT IN READING	Multiple Choice score /32	Reasoning	Communication	Organization of ideas	Application of Language Conventions	OVERALL WRITING ACHIEVEME	Problem Solving	Understanding of Concepts	Application of Mathematical Procedures	Communication of Required Knowledge	OVERALL MATH ACHIEVEMENT	Multiple Choice score /40	Number Sense and Numeration	Geometry and Spatial Sense	Measurement	Patterning and Algebra	Data Mgt. and Probability
F	4	4	4	4	4	25	4	4	4	4	4	3	3	3	3	3	35	2	2	4	3	3
M	2	3	1	2	2	14	2	2	2	2	2	2	2	3	2	2	20	2	1	2	3	1
F	3	3	3	3	3	21	2	2	2	2	2	3	3	3	3	3	30	2	2	4	2	3
F							2	3	2	2	2	2	1	3	3			1	2	2	1	1
M	3	3	3	3	2	13	2	2	2	2	2	3	2	3	2	3	32	3	2	3	3	4
F	3	3	3	3	3	20	3	3	3	3	3	2	2	2	2	2	25	2	2	2	1	1
M	2	3	2	3	3	25	1	2	2	3	2	3	2	3	2	3	31	4	4	4	4	4
M	2	2	2	3	3	23	2	2	2	2	2	2	3	3	3	3	33	3	3	4	3	3
M	3	2	2	2	3	24	2	2	2	2	2	3	2	3	3	3	30	2	2	2	2	2
M	2	2	3	3	3	23	4	4	4	4	4	2	2	3	2	3	29	3	2	2	3	3
M	2	2	2	2			2	1	2	2	2	3	2	2	2							
F	3	3	2	3	3	21	2	3	3	3	3	3	3	4	3	3	30	4	3	3	4	3
F	3	3	3	3	3	20	4	4	4	4	4	2	2	2	2	2	23	1	1	3	2	3
F	4	4	3	4	4	26	3	3	3	3	3	4	3	4	3	4	37	4	3	3	3	3
M	3	3	4	4	3	19	2	2	2	2	2	3	3	4	4	4	36	4	3	4	3	4
F	2	3	2	2	3	25	2	2	3	2	2	3	4	4	3	4	35	2	3	4	4	3
M	4	4	3	3	4	23	4	4	4	4	4	3	4	4	4	4	36	3	2	4	3	3
M	3	3	3	3	3	25	4	4	4	4	4	3	4	4	4	4	35	3	3	4	4	4
F	3	3	2	3	2	13	2	2	2	2	2	2	2	2	2	2	28	2	2	2	3	3
F	3	3	2	3	3	23	3	3	3	2	3	2	2	2	2	2	23	1	2	2	1	2
F	3	3	2	3	3	19	3	3	3	3	3	3	3	3	3	3	29	2	4	3	2	3
M	3	3	3	2	2	16	3	3	3	3	3	3	3	3	3	3	24	2	2	3	3	3
F	3	3	2	3	3	20	3	3	3	3	3	2	2	2	2	3	30	3	3	3	2	4
F	3	3	2	3	3	20	2	3	2	2	2	2	2	3	2	3	24	3	3	3	3	2
F																						
F	3	2	3	3	3	21	2	2	2	2	2	3	3	3	3	3	35	3	3	3	3	4
M	3	4	3	3	3	20	3	3	3	3	3	3	3	3	3	3	28	4	4	3	4	3
M							1	1	1	1	1											
F	3	4	3	2	3	17	2	2	2	2	2	4	4	4	4	4	19	2	2	3	2	2
F	2	3	2	2	3	23	3	3	3	3	3	2	2	3	3	2	19	3	2	2	1	2
F	2	2	2	2	2	22	3	3	3	3	3	2	2	2	2	2	22	2	3	3	3	2
F	3	3	3	3	3	24	3	3	3	3	3	3	3	3	3	3	30	2	3	2	3	2
F	3	3	3	3	3	22	4	4	4	4	4	4	3	4	4	4	33	4	4	3	3	3
M	3	2	3	3	3	20	3	3	3	3	3	3	3	3	3	3	30	2	2	4	4	2
M	2	2	2	2	2	19	2	3	3	3	3	3	2	3	2	3	25	3	3	2	3	3
M	3	3	2	3	3	16	2	2	2	3	2	3	3	3	3	3	32	2	3	3	4	3
AVERAGE LEVEL D. CLARK'S CLASS	2.9	3.0	2.5	2.9	3.0	20.8	2.6	2.8	2.8	2.7	2.7	2.6	2.5	3.0	2.7	1.0	29.8	2.5	2.4	3.0	2.7	2.8
AVERAGE LEVEL S. BEZZO'S CLASS	2.7	2.8	2.6	2.6	2.8	20.4	2.5	2.6	2.6	2.7	2.6	3.0	2.8	3.1	3.0	1.0	27.3	2.7	2.9	2.8	3.0	2.6
AVERAGE LEVEL FOR ALL GRADE SIXES	2.8	2.9	2.5	2.8	2.9	20.7	2.6	2.7	2.7	2.7	2.7	2.7	2.6	3.0	2.8	1.0	29	2.6	2.6	3.0	2.8	2.8

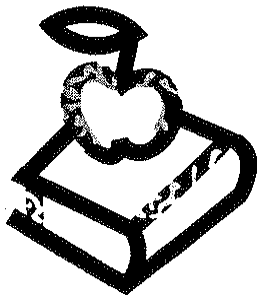
APPENDIX 4-Results of Teacher-Compiled Math Questionnaire

QUESTION	POSSIBLE ANSWERS	GRADE 6		GRADE 7		GRADE 8	
		GIRLS	BOYS	GIRLS	BOYS	GIRLS	BOYS
Which of the following experiences in math is your **favourite**?	using manipulatives	7 %		6 %			8 %
	math journals	7 %			8 %		
	measuring and estimating	15 %	14 %	6 %			8 %
	word problems		29 %	6 %	15 %		25 %
	solving algebraic equations			6 %	8 %	22 %	8 %
	slides, flips, and turns		14 %			17 %	17 %
	pencil and paper tasks			9 %			25 %
	constructing angles	7 %			8 %	22 %	8 %
	describing patterns				8 %		
	graphing	38 %	29 %	50 %	23 %	39 %	
	creating and using nets			14 %			
	probability games	23 %	14 %	9 %	31 %		
Which of the following Which of the following experiences in math is your**least** favourite?	using manipulatives					7 %	
	math journals	33 %	25 %	24 %	62 %	27 %	55 %
	measuring and estimating	8 %		5 %			
	word problems	42 %	25 %	24 %	23 %	33 %	9 %
	solving algebraic equations			5 %	8 %		9 %
	slides, flips, and turns	8 %	13 %	5 %		13 %	9 %
	pencil and paper tasks	8 %	13 %	19 %	8 %		9 %
	constructing angles			5 %			
	describing patterns		13 %	14 %		20 %	9 %
	graphing						
	creating and using nets		13 %				
	probability games						

		GRADE 6		GRADE 7		GRADE 8	
Are you concerned about the reaction of members of the opposite sex when you give answers in math class?	yes	GIRLS 27 %	BOYS	GIRLS 43 %	BOYS	GIRLS 21 %	BOYS 8 %
	no	73 %	100 %	57 %	100 %	79 %	92 %
Do you think your marks in math this term accurately reflect your ability to do the subject?	yes	83 %	43 %	72 %	46 %	71 %	55 %
	no	17 %	57 %	18 %	54 %	29 %	45 %
When completing math assignments, do you like to work:	alone	15 %	25 %	5 %	38 %	40 %	23 %
	in a group of all girls	38 %		10 %	8 %	13 %	
	paired with a girl	40 %		45 %		40 %	15 %
	in a group of all boys		13 %		15 %		
	paired with a boy		25 %		23 %		15 %
	in a group of boys and girls		36 %	40 %	15 %	7 %	54 %
If given a choice, would you prefer to attend a math class of:	all girls	64 %		38 %	8 %	29 %	9 %
	all boys		57 %				
	boys and girls	36 %	43 %	62 %	92 %	71 %	91 %
Do you like mathematics?	yes	67 %	71 %	55 %	67 %	57 %	90 %
	no	33 %	29 %	45 %	23 %	43 %	10 %
Are you good at math?	yes	73 %	86 %	59 %	67 %	43 %	91 %
	no	27 %	14 %	40 %	23 %	57 %	9 %

Improving Literacy Through Improving Students' Attitudes Toward Reading

Helen van Poorten



Helen van Poorten
Elementary Teacher
Lansdowne-Costain

Helen van Poorten has been an elementary teacher with the board for many years and will be retiring this June. She has a special talent at using her artistic ability to bring out the best in her children.

Focus

Bernie Krause, my teaching partner and I were interested in improving our students' attitude toward reading. Through observation we had determined that students were hesitant to read for the pure enjoyment of it and rarely chose to read during any moments of spare time in class. There was little if any discussion about books read and unless it was an assignment, writing assignments regarding novels were sparse and lacking in thought and enthusiasm. During silent reading time, many students had difficulty choosing a book that would sustain their attention for more than a few moments and those students did not, therefore look forward to this time each day. When asked about a favourite author or book title, they were unable to name any.

We began by examining past EQAO results, tests and anchor booklets. We made a list of what students would need to know and be able to do to reach a level three or four in their reading and writing. We then discussed how we could help students acquire these skills and what materials we might need to make this happen. Our individual action research projects were a direct result of this discussion.

Summary

We were interested in improving our students' attitude toward reading. Through observation we had determined that students were hesitant to read for the pure enjoyment of it and rarely chose to read during any moments of spare time in class. There was little if any discussion about books read and unless it was an assignment, writing assignments regarding novels were sparse and lacking in thought and enthusiasm. During silent reading time, many students had difficulty choosing a book that would sustain their attention for more than a few moments

and those students did not, therefore look forward to this time each day. When asked about a favourite author or book title, they were unable to name any.

Process

In order to determine a plan of action, we began by giving the classes a reading interest inventory which we adapted from "Experience Language". On one side it asked the children to rate book topics which ranged from fantasy and humor to understanding adults and current events. The possible rating scale was A for "You super like it," C for "It's just OK" and D for "You find it boring". The other part asked 12 questions about how they feel about reading. The questions ranged from: "How do you feel when your teacher reads a story out loud?" to "How do you think your best friend feels about reading?" The same rating system applied.

We followed the inventory with a genre study. We chose mystery stories and decided to do it as a "literature circle" discussion format. We had also wanted to do an author study but due to time constrictions, this was done as novels read to the class by me, the teacher. Since the Canadian author Eric Wilson was scheduled to come to our school in June I chose several of his mystery novels to read aloud and discuss.

The planned books talk where children dressed up as their favourite character was scratched due to lack of time. With the enthusiasm the Eric Wilson books created, they would have enjoyed that activity enormously.

After teaching the various roles needed for the literature circle discussions, the children were allowed to choose the mystery novels they thought they would enjoy reading. The choices came mostly from the "Literacy Place" set which had been augmented in this area. The top group chose from Eric Wilson selections. "Jobs" I decided to include were: Discussion Director, Artful Artist, Connector, and Passage Picker. They rotated through the roles.

The enjoyment of the chosen books was evident from the start. There was never a day when there was a complaint about reading and preparing time. There were difficulties, however getting the whole group to be ready for discussion time. The usual non-workers were reluctant to take home the assignment and if they did, it was frequently left at home, resulting in one or more group members not ready when needed. If it happened to be the Discussion Director, this resulted in a short and unsatisfactory group talk. Another time I would send a note home asking for more parent involvement. Treating the whole reading/reparation time as a homework assignment routinely might even be worthwhile. This might result in more in-depth questions and connection-the two most thought-provoking jobs.

During Literature Circle time, I wandered from group to group listening to their discussions and encouraging more thoughtful answers and keeping the participants on track. Periodically, I chose a particularly good question from the Discussion Director or one of the other members to share with the class after discussion time to demonstrate its excellence and encourage the same from others. At the end of the novel study (which took about 4 weeks) I asked the children to evaluate the experience and each other as group members. This was in the form of a rubric which I sent home with their folders at the end of the time so the results are not available but they were very honest in their evaluation of their peers. The criteria were: readiness for discussions, interest level of questions, task commitment and participation level. At the end of the page were 3 questions about their own evaluation of the whole process. All but one indicated that they enjoyed the book they chose, about 80 percent said they liked talking about it with the group , the rest said they somewhat enjoyed it, and

most said that they found they looked forward to reading the next chapter because of the discussion group sharing.

Results

Overall, the literature circle process was very successful both from the children's point of view and the teacher's. They children would improve in the quality of their responses with more experience, I am sure. One time at it is not enough.

The read-aloud time was hugely successful. We all enjoyed 3 novels by Eric Wilson, spent much time discussing and critiquing his style and predicting next developments. Many connections to real-life were possible because the stories take place in somewhat familiar places and the characters are not too far from their own age.

The enthusiasm spilled over into our writing period as each child wrote Mr. Wilson a letter and many joined his advertised "mystery club" (which we later found out from him no longer exists-much to their disappointment). His visit to our school was eagerly anticipated and greatly enjoyed. The children were thrilled to shake his hand and were glued to his words and excited that they knew so many answers because they were familiar with his work. They really felt they had met a celebrity.

At the end of the time period we once again administered the "Reading Interest Inventory" The results were as follows:
The book topics evaluation "super like it" category increased with about half the class and either stayed approximately the same or decreased with the rest. This was disappointing but understandable in view of the fact that only the mystery genre was covered in the short time available. If during a following year a larger variety of types of books was covered in a "literature circle" way a more significant increase would possibly be evident. In the category of "mystery" 7 children who had previously indicated a "C" or a "D", increased those to a higher level of enjoyment. The majority of the others already rated it as an "A" and continued to do so and a few actually decreased in their rating, which really surprised me. The conclusion I would draw from this is that if several of the less highly rated categories were studied in the same ways throughout a following year the overall results would be more encouraging.

Conclusions

The experience was successful but limited in its results. The Literature Circle technique needs to be well taught and evaluated and repeated throughout the school year to be successful. More forms of genre could be handled in the same way - perhaps one a term.

More time needs to be spent throughout the literature circle experience discussing good questions as well as techniques for encouraging good answers and valuable discussion. This was not very well done by me or the children and the result was that the discussion times tended to be too brief and superficial. It would be worth while to have a short evaluation time at the end of every group meeting time for this purpose.

More home involvement would be beneficial. A letter home informing parents of the particular genre in current study and encouragement to seek library books in the same one would be something worth adding. Also, as previously mentioned, sending preparation home as an assignment would perhaps get better results as well as parent awareness.

How to Improve Student Writing

Julie Beth White

Julie Beth White
Grade 4 Teacher
Grand Erie District School Board

Plan of Action Improving Student Writing

1. **Increase Enthusiasm**
   - show them writing is fun
   - make writing classes shorter so students don't get bored
   - share stories with each other
2. **Importance of Writing**
   - not just good grades
   - make writing relevant – letters, stories, paragraphs, poems, newsletters
3. **Increase Detail**
   - specific story planners that allow for detail
   - practice writing paragraphs and varied sentences
   - lessons on descriptive language
   - character and setting development lessons
4. **Foster creativity**
   - give students part of the story and they fill in the rest
   - give opening line
   - reading response so they can use ideas form the story already written
5. **Strengths, Weaknesses and Next Steps**
   - students edit each others work
   - student and teacher conferencing
   - writing together
   - use next steps on next assignment

Julie Beth White, GEDSB 2000
PC Concepts 1101

AN ACTION RESEARCH PROJECT: HOW TO IMPROVE STUDENT WRITING

By Julie White
Grand Erie District School Board

The data from the grade three Provincial Testing in 1998-99, indicated a strength in writing amongst my current grade four students, however I was not witnessing this level of success in daily writing activities that these same students were doing in my classroom. More specifically,

- identified students in the area of communication all scored level 2's at grade level. Students met expectations for the first term report in my room; however they had weak spelling and grammar skills. Their ability to communicate using evidence also needed improvement. Their first term report matched the provincial testing from grade three.
- students that scored level 3's on the provincial testing were consistently achieving level 2's on the written assignments in term one of grade four.
- students that scored level 4's on the provincial report card generally were just as successful during term one of grade four.

These observations immediately concerned me because although students scored well on the provincial testing, their initiative toward writing in my classroom was low. Although students at the ends of the assessment scale were maintaining their success as per the provincial test results, they were making no improvements. Students that were achieving the provincial standard on the grade three assessment were showing declined success in their writing program, achieving only level 2 on the term one report card.

I decided to make some observations of student performance and survey attitudes toward writing as the basis of my research.

- students were not enthusiastic about writing. The majority of my grade four students saw writing as an academic task and only do the assignments because good grades are important to them. Initiative toward writing is low.
- many students rush through any written assignments, therefore making careless errors and forfeiting detail and precision necessary for level 4 success.
- many students lack the creative scope for storytelling.
- students are reluctant to use peer editing suggestions and next steps to improve their writing from one assignment to the next. They feel that a grade on an assignment is final and that there is no connection between the work they do on one assignment to the work they do on another.
- students lack independent work habits and therefore do not focus during writing sessions.

I feel strongly that writing is an important skill for students to develop. I use writing regularly in my profession as well as in my personal life. I feel the writing that the students do in my room could be much better in terms of the detail, scope, and convention use appropriate for the grade. I also feel that it is important for students to have a more positive and productive attitude toward the written work they do in the classroom. With the right perspective and tools, all students can find success and enjoyment in putting their thoughts on paper.

In order to bring my classroom practice and student success closer to my values about writing, I set goals for this research project:

1. increase enthusiasm for writing (initiative)
2. teach the importance of writing
3. increase detail students put into written work
4. encourage and foster creativity in the writing process
5. corrective action: use Strengths, Weaknesses, and Next Steps

I began by constructing a plan of action. (attached)

The most difficult part of the research was trying to decide which action I would start with. All were important to me, but I needed to choose the action that would be most appropriate for my students. I decided that I would start by modeling the writing process in a collaborative writing session with my students. This would address my

first and third goals. This activity took several days to complete. I saw this as a productive use of classroom time because it showed students that the writing process cannot be rushed. I also felt that I could create enthusiasm for writing in my students by modeling the joy that I find in writing, as well as show them how fun creating can be. Since all students would be involved, they each could experience the success of writing an interesting and well-organized story as a team.

Following this exercise, students were eager to create a story independently that was just as interesting as the one we did together. Also, students slowed down the pace at which they would normally write, and as a result, their final draft copy included more detail and fewer errors than in the stories they submitted in term one.

I found that students still had difficulty following the planning stages of their writing. This may partially have been because they were following the plan from the blackboard rather than filling in a concrete story map that I had produced to help them organize their ideas. As well, although students were enthusiastic about inventing their own plot, they still demonstrated difficulty in deciding on a problem and solution that would lend to the development of a lengthy and descriptive narrative expected in a level 4 performance.

Next, I decided to introduce a story map to help students organize their ideas prior to writing the rough draft. Although I had always used story maps before, I felt this one would be more effective because it is designed in a manner that promotes the proper organization of ideas in the plot, and allows for the development of detail. (Graphic Organizer by Janet Rubus attached)

Along with the story map, I decided to give the students a writing prompt to encourage creativity and help those students who have difficulty coming up with an idea to write about. The writing prompt that I used included two illustrations. One illustration depicted a problem and the second one depicted the solution (attached). Students needed to use the story map to organize their plot around the two pictures. Each student was able to adapt their story personally by the characters they chose and the event leading up to and preceding the given problem and solution. These steps helped me address my fourth goal.

As a result of the modifications I made to the format in which students would engage in the writing process, students were much more successful at writing this story than they were at writing the story they did immediately after the shared writing experience. They continued to work slowly and take more care to avoid unnecessary errors. They liked using the story map because it showed them how much they needed to write and this made their stories longer. They also shared that they liked writing this story because they didn't have to think as hard about what to write because I had given them the prompt. I observed that students did not become anxious or preoccupied during writing class because they had an idea and a plan that allowed them to get right down to writing.

The next goal that I wanted to address was number five: using strengths, weaknesses, and next steps to improve student writing. Since students were much more focused during writing class, I was able to conference individually with students as they completed their final drafts. When I first started conferencing with students, they immediately wanted to know their grade. After listening to a presentation by Ruth Sutton, I began experimenting with the use of corrective feedback in the form of strengths, weaknesses, and next steps. I was not interested in giving the child a letter or number score. I wanted to make all my evaluations in words. The conferencing involved me reading their story aloud to them and recording anything that they noticed was not correct. Then we made the corrections together. After this we began to make a list of strengths and weaknesses. At first I had to prompt most of the conversation. ***(How do you think you did at breaking your story into paragraphs? How is your spelling? Punctuation? Could you have edited more? How do you know this now?)*** To end the conference, the student produced two next steps they wanted to focus on in their next story. This also meant that they had to continue to be diligent about the things they did well.

I still felt that the enthusiasm toward writing was not high enough in the classroom. This was evident in responses to novels completed by students. They seemed to revert back to their old writing habits when asked to make a written response to literature. I wanted to make the connections between good writing and other subjects or activities in their life. This was my

second goal set out at the start of my research. I noticed that my students always seemed more interested in picture books than in the novels they read in class. When given the opportunity to withdraw books from the library, they would always return with picture books. After investigating this observation, I determined that students chose these books because they had vivid pictures, and because they could read them more quickly than a novel. It was an issue of attention span. This helped explain why student initiative toward writing was low. The process required a long span of attention across several classes to complete. I also connected my students' fondness for picture books to an article by Cheryl Dinnin: Picture Books - A great way to motivate writing. In the article, Dinnin explains that picture books are a highly efficient way to stimulate creative writing.

Using this concept by Dinnin, I decided to make some of my students written assignments shorter and based on picture books that I read aloud to them. I refer to this type of assignment as reading response. It would cover the reading expectation of making judgements on the basis of evidence in a book as well as foster creativity in student writing.

The first reading response assignment that I assigned was in response to The Wizard of Oz. The scene was when Dorothy first got to meet with the Wizard. Students were asked to write the script of what they would say and what would happen if they were Dorothy and were about to meet the Wizard themselves. I advised students to practice saying what they would say out loud before writing. I thought this would help them organize some of their ideas ahead of time. Responses were quite short and unimaginative. Students rushed through the activity just as they had rushed through their writing pieces at the beginning of the year. I decided to introduce corrective action to my students, and therefore did not put a grade on their paper, but rather formatively assessed their writing. I advised them on how they could improve their response. We then talked about all the different things that would be going through Dorothy's mind. This modeled the brainstorming process of writing stories. I was again reminded that students have difficulty making connections between writing stories and using writing in other subjects. It also reaffirmed my goal in teaching the importance of writing as not just an isolated classroom activity.

After this session of brainstorming, I offered the students an opportunity to rewrite their responses. If they didn't want to, they could resubmit what they already did for a grade. The majority of my students wrote a second draft which proved to be much better. It also gave them a comparison of what they did and what they could do. I used this leverage to prove to them that they can all do well if they don't rush the process. Students have now completed several responses to literature and have been very successful at producing level 3 and 4 work.

I have also realized the importance in giving students opportunities to improve providing they put forth the effort. Since I allowed students to improve their response to The Wizard of Oz, I have had several requests from students to ***"try again"*** **or** ***"have a little more time to do a better job."*** This also shows me that they are definitely enjoying writing more and are able to identify where they can make improvements more accurately. They are ultimately identifying their own strengths and weaknesses before submitting their work. This is an essential part of the editing process. It shows me that students are more aware of their ability to engage in corrective action and therefore are independently assessing their own work in order to make improvements before submitting it for a final grade. Lastly, many students are spending their extra class time creating new stories that they plan from start to finish independently. I assess them the same way I do the assigned tasks, Students can use these as part of their portfolio. At the end of the term, I will allow them to choose the five stories they feel best display their writing ability.

I continued to use writing prompts to initiate student stories. I also alternate my approach by offering them different parts of the story rather than just the problem and solution. In one instance, students were given detailed descriptions of the characters from which to base their stories.

Although my attempt to improve student writing will continue to be a focus in my classroom, for the purpose of my research I had students fill in a writing survey again to compare their responses from the start of the year. Attitudes toward writing showed improvement.

There was an increase in the number of students that enjoyed writing stories and they felt they were putting a better effort into written responses in the classroom. Students were also able to explain the strengths and weaknesses they had in their writing in much more detail than at the start of my research. They are actively engaging in corrective action by identifying their own areas for growth and using the corrective feedback they obtained during conferencing.

With the implementation of the above strategies, I have witnessed a marked improvement in student writing. Fellow staff members that I have shared pieces of writing with have commented on the remarkable detail and organization produced by grade four students. As well, my own personal student records and journal entries show growth in the development of positive attitudes and increased success in the writing of my students.

To continue my research, I plan to implement a shared reading session to generate even more enthusiasm. by allowing students to share their stories, I feel that they will continue to take pride and put forth a good effort in their written assignments.

I also want to introduce additional stages to the writing process that will encourage students to develop their own creativity for story writing by brainstorming independently. (Graphic Organizers by Janet Rubus attached)

I will create a format for editing that will replicate the conferencing process that the students engaged in with me. Instead of coming to me to help them determine their strengths and weaknesses, they will conference with peers during the editing and revising stages to improve before submitting for assessment. I want students to become even more aware of the expectations, and their goal setting skills.

Beginning this process in September will be crucial to allow for more varied writing assignments. In order to show students the importance of writing outside the classroom, written activities will need to be relevant to their lives or their parents' lives. Assignments such as letter writing and having students write their own classroom newsletter will be introduced.

Planning a flexible timetable will be important to allow for shorter, but more frequent, writing periods. Student attention and therefore motivation can be maintained if the time span for writing is kept shorter.

My assessment practice for September will be modified in several ways as well. My mark book will reflect the importance of corrective feedback and allow students the opportunity to use the feedback to improve. As Ruth Sutton suggests, any assessment recorded in my mark book will be done in pencil, so it can be changed once the child has demonstrated each new skill. Summative assessments will be avoided until the end of each term. I would also like my assessment to be done collaboratively with students. It would require separate mark books for each student, but I would like for their grades and the formative comments that I record to be available to them to look at throughout the year for the purposes of personal goal setting.

Lastly, I plan to share my research during a professional development workshop in order to gain more insight into other classrooms and the procedures that are working well for my colleagues. Hopefully, what I have learned will be an asset to their programs as well.

My Story Plan

Name _____

Problem: _____

_____

Characters: 1. _____

_____

2. _____

3. _____

Setting: _____

_____

_____

_____

What Happens in the Story:

1. _____

_____

2. _____

_____

3. _____

_____

4. _____

_____

5. _____

_____

6. _____

_____

How Problem is Solved: _____

_____

_____

Improving Student Initiative and Independent Learning

Susan Young

Susan Young
Grade 7 Teacher
Banbury Heights School

Sue Young is a grade 7 teacher at Banbury Heights Elementary School in Brantford. Sue spent much of her time as a special education teacher. She has developed an understanding and appreciation of a variety of learning styles as a coach, adaptive swimming instructor and teacher. Her goal has always been to take children from where they are and move them forward. Sue became interested in an action research project when she found poor test results and poor self-esteem in students who were struggling with a new curriculum. She hoped to be able to improve their confidence and self esteem along with their achievement.

1. **Focus:** "How can I improve student initiative and independent learning skills?"

2. **Process:**

   2.1 Rationale:

   - Need to improve EQAO test results by improving student achievement.
   - Need to assist students in taking initiative for improving their own learning.

   2.2 Steps:

   - Teaching students how to structure questions so they could get help with what they did not know.
   - "Experiment test" in math as a corrective feedback strategy.
   - Opportunities for corrective feedback in the monthly D.E.A.R reading assignment.
   - Establishing `the table' that students could use for getting help, once they had a specific question.
   - Teaching students to predict and write their own report card.
   - Self-Assessment/Conference form for setting learning goals.

3. **Findings:**

   1. Asking for help, coming in for extra help and handing work in early had the greatest impact on student achievement.
   2. Being "important enough" to contribute ideas to their own education improved student attitudes and achievement.
   3. 72% of students reached their first term goals, 80% thought goal setting helped improve achievement, and 82% thought goal setting improved their grade 7 year.
   4. 78% of students felt that working on the third page of the report card through the Self Assessment/Conference Form improved their commitment to improving their learning
   5. Participating in action research improved teacher's motivation to reach goals and track results.

About Me

I have considered myself a "special ed" person for most of my adult life. This is in fact due to my own success and failure throughout every aspect of my own educational career. I have developed understanding and appreciation for a variety of learning styles. I feel excitement and empathy for any person willing to accept a new challenge and the potential frustrations that may accompany that challenge.

Whenever I have worked with children, as a coach, as an adaptive swimming instructor, or as a teacher, my goal has always been to take the children from where they are and help them move forward. I am dedicated to improving self-esteem and building self-confidence. After a variety of experiences in regular classrooms and in special education I have developed a strong belief in the importance of learning skills and self-advocacy.

Like many people, one of the biggest challenges in my professional and personal life is the organization of time. There never seems to be enough to accomplish all the things everyday life requires. It has been the struggle to find a balance that has helped me to become a solution seeker. Out of necessity, I consider problems to be established facts; therefore, the only available avenue is to look for a solution that will work most efficiently for all concerned. That brings me to the birth of this action research project.

The Problem

I did see myself and my students having a few very frustrating and limiting problems. Results of grade 6 testing revealed that my students were among the lowest in the province. In-class instruction was often difficult because students did not see relevance to their daily lives and were hesitant to make the necessary commitment to grow and improve. The new heavier curriculum in grade 7 proved to be very difficult for my students especially in the area of math. With the transition to a new division came higher expectations and added stress, not only for the students but for the parents as well. This was only compounded with the idea that high-school was looming. As well, I had to consider the difficulties each student was facing as an individual, depending on their level of intellectual, emotional, physical, and social development, which is, of course, part and parcel to any grade 7 classroom.

These problems resulted in frustration for my students and myself. This led to incomplete assignments, excuses, avoidance, denial, shut-down, inappropriate behaviour, parental concern and at times indirect permission from parents to accept results that were well below their child's potential. Overall, I saw my class as a very dependent group that, for the most part, was not able to use suggestions to improve or see the need to improve.

I realized it was going to be a very long year if we could not find some solutions to at least a few of the problems. I was going to be putting in a lot of effort no matter what I did. I figured I could work on the positive or continue with the negative. Since I find being positive to be a lot less draining, and a whole lot more fun I decided I wanted/needed to make some positive changes that would impact my students.

Looking for Strategies

At first, based on the EQAO results, I thought improving student's reasoning skills may be the answer. Then after some

reflection I thought the key factor may be helping them improve their communication skills. But it really came down to a more basic level and though those goals were important they were just that, the end goals.

My Question

So, as with any goal I needed to narrow it down, to define the steps I was going to take to achieve these goals. I finally decided the solution lay in helping my students improve their initiative and independent learning skills. I decided to focus on these two learning skills for several specific reasons. Then I asked myself,

"How can I improve student initiative and independent learning skills?"

And that was the beginning of this action research project.

Where We Started

Most of the students were unable to ask for help in class on two fronts. One they would not bring their difficulties to my attention, and secondly many students were not able to breakdown their difficulty to phrase a question that may help them. If they did respond to something new or frustrating they simply stated "I don't get it." Students would not come in for extra help. Many assignments were completed with minimal effort. It was good enough as long as they had something to put in the pile. Many assignments were handed in incomplete or not handed in at all. Quite often there wasn't even an excuse from the student as to why their work was incomplete. Students wouldn't (or couldn't) use class time effectively. Many demonstrated an inability to take responsibility for their own work, or their own actions. Students were apathetic, unable to take pride in their work. Goal setting was non-existent. It was either not an issue or students did not know how to do it. Therefore they never experienced the thrill of achieving their goals.

The Improvement Process

I started with small steps. I began building vocabulary so that students could recognize information that they did know and then they could ask for help with what they didn't know. We worked on questioning. Students needed to have a question. They could not say "I don't get it" because we decided that was the established fact that was now going to be the problem. We needed to look for a solution. Students were encouraged to start with what they knew and to show all work. This helped me see what they were thinking. I often said, "I can't help you if I don't know what is going on in your head".

Then I re-arranged the marking scheme, continuously showing them how they could "collect" their marks, by starting with what they knew and writing it down. When taking up daily work I would show them how the marks would be collected. At the same time I introduced the "Experiment Test" in math. It provided corrective assessment for the students and was not used for evaluation, although I did keep track of their marks to compare to the actual test. I would mark the test using the marking scheme and would include any pointers that would help the student improve their answer. Once I handed them back to the students we would review the test.

Students were expected to help each other. Each question would have student experts that were able to fully explain the question. Other students needed to seek out an expert to help them polish their own skills. Many students took pride in being the expert (which has included every student over the course of the year). Students were given time and were expected to seek help for themselves. I thought this would promote initiative and self advocacy skills. It helped students realize what they really did know and what they needed to work on. It showed

the students in advance what the expectations were going to be. It provided them an opportunity to work out any "kinks" and learn from their mistakes and to seek help when it was required. It helped students organize their time more effectively and reduced test anxiety. I did notice that once the students became familiar with the system it helped them with goal setting as well.

"I feel that experiment tests help me know what to study, they cut study time. I feel more confident going into the test. By doing these tests my marks have improved a lot. I do not worry as much when I'm doing an experiment test because I know it will help me work out my kinks. I think these experiment tests are great."
(Nicole - Grade 7 student)

This theory did have some carry over into the language program. We decided to incorporate the idea into the monthly reading assignment, 'D.E.A.R.' Students were encouraged to hand in the assignment early for marking. Once it was marked it would be returned to the student so that they could add any relevant details previously not included. They could clarify thoughts, correct spelling or grammar errors. Students could do this as many times as they wanted with each report as long as it was before the actual due date. I thought this would be the ideal spot since it was an independent, ongoing assignment and students could directly see the positive results of their own initiative.

Many students started taking advantage of this system. Each month I have had at least 12 students hand in their report early and improve their mark by a minimum of 10%. This was very simple to track. It was just a matter of recording each mark for the month as I would do with every assignment. With this type of marking time line students started seeing the direct impact their initiative could have on their success. I knew the students were beginning to see the connection when they started asking me, "When are you going to mark it?", "When can I get it back ?", or "Can you mark it right now so I can see what I got?" or "If you don't mark it in time for me to make corrections, can I have more time?"

Next I needed to help students recognize help as a positive solution, excuses were not acceptable!

The before 9 o'clock time slot for help was not working, nor was staying after school and of course no-one was setting up any special appointments. My students weren't there yet, a fact I had already identified. (Hence the whole purpose of setting the goal to improve their initiative and improve their independent learning.)

<u>The Table Strategy</u>
I wanted them to come to me. I did not want them in their desks putting their hand up looking for help so that I could run around the room at their beck and call, supporting their dependency or listening to their complaints about the expectations. I wanted them to see that they needed to come forward for themselves to seek help, to self-advocate, that is when "The Table" came into being. It is simply just that, a table that can seat six comfortably. It is placed lengthwise at the front of the room. (although my room is a bit small to accommodate it, it has been well worth the compromise) After each lesson (especially in math) I would sit at the head of the table. This allowed me to be at the front of the room for effective supervision, be accessible to the board to refer students back to specific examples that might help them and to help several students all at one time without

wasting time walking from one student to another. Students would come to the table as the need arose. They needed to bring their workbook and their text book, and a specific question. They could not state the "established fact". They would not usually stay at the table but would basically rotate through and once they felt confident in their own abilities I would send them to go back to their desk to work on their own. I wanted them to think for themselves, to take a chance, because I believe we learn more from mistakes than from doing everything right. For some students, however, staying at the table, made the difference in any work at all being completed, which also assisted with class room management.

Seeing Results

In the beginning, the table provided the one and only spot where students would seek help. Of course, initially, it was the same group of students that would rotate through on their own, or the same ones that would be invited to the table to assist with management while many of the others would/could not buy in. Still I thought the table was worthwhile because the table was always full. I am pleased to note now though, that first voluntary group has now begun coming in at 8:20-8:30 am. for extra help In the month of April I have had 57 student visits for help before 9:00 am. The people who were hesitant have now begun to use the table during class. Many students have begun to move to the table for the actual lesson, moving closer to the board and becoming more involved with the lesson, proof that the students are improving their own commitment to learning and taking initiative.

"I like using the table. It has helped me because I get answers quicker and then I don't waste my time waiting with my hand up. It is more helpful than the traditional style with the teacher coming around to hands that are up. It has helped me reach my goals because I can get more information from the teacher, and the teacher doesn't have to rush to the next person with their hand up." *(Dan - Grade 7 student)*

Their Efforts and Their Marks

As my students began to see their role in their own success I knew it was important to show them the direct relationship between their efforts and their results on the report card. I thought it was important that the students understand how marks were collected. I wanted them to see that they earned their marks and I as a teacher simply collect the marks; that, in fact, they were the driving force in their own success. To accomplish this I thought it would be a good idea if I gave each student a blank report card. I explained the setup for grade 7, that this year students could expect actual marks not letter grades. I tried to show how different strands often tie together e.g., history may affect reading or writing sections. Learning skills were truly part of every aspect of the school day. Next, over the course of several days we discussed the Learning Skills, and "What they looked like". I believed that the students needed to have a working definition of each one if they were going to use them to be successful. I particularly focused on the Independent Learning and Initiative. I continuously reviewed these ideas with the class and helped to refocus them with these particular skills in mind. At the end of first term I had students make predictions for their report cards after reviewing the term. Then individually I would tell them if they were in the right ball park

"I liked making the predictions. It helped me to prepare myself so I wasn't surprised. They helped me improve my marks because

I could understand why I got the mark that I did and what the comment on the report card was telling me. It helped me because if my parents didn't like something I could be sure to tell them why I got a mark and I could reassure them I have a goal to improve." (*Nicole - Grade 7 student)*

Setting Goals and Achieving Them

Once the students began to ask questions and for help and realize their own ability to improve their marks for themselves I decided we needed to keep moving forward with this new found momentum by setting goals. I believe that goal setting improves performance, helps build self esteem, gives the goal setter an opportunity to gain some control in their own life (which is an important struggle for grade 7 students), and helps them take responsibility for themselves. I also think it is very difficult to set realistic, achievable goals and plan the necessary steps to achieve those goals.

In the morning of "report card day" each student was given their report card and since we had done the predictions there were no surprises. They had time to review them and chat with friends about them. I needed to get past the hubbub of reports so that we could work with them. Then I gave each student a "Student Self-Assessment /Conference Form". It was broken down into three parts. One area was for the student. They had four questions to answer. They were "What do I do well?, What I want to learn more about?, What I need to improve?, and Steps I will take to improve". The next two areas were for the teacher and the parent. We needed to answer three questions. They were "What do you do well?, How I can help you?, Steps I will take to help you improve." I had the students use the report cards to help them fill out their section.

I filled out my section in an individual conference with each student. I told them what I thought they did well, but then I asked them for their input for the other two questions. This gave me the opportunity to ask each child what would actually make the difference for them, and to have a little more insight into their individual learning style. The students were to take the form home with the report card so that parents could share it and as well make a specific commitment to helping their child be successful. During this conference I had students set goals for second term based on the report card. We then talked about specific things they would need to do to achieve this goal. The students recorded this on the third page of the report card before they took it home. Throughout second term I often returned this page to the students to remind them of their goals. We would make predictions as to the success they were achieving, if the steps they had set out were being followed, and/or were helping them reach their goals. At the end of second term we reviewed our first term goals with our report cards. On the third page students had to re-state their goal and note whether or not it was achieved. They needed to restate the steps they had planned to take to reach their goals. Then they had to reflect to see if they had actually used the steps, if the steps helped them reach their goals, or why they had not used the steps. Then the students had to list all the areas that they had improved on the report card regardless if it was part of the goal or not. Then they needed to set their goals for third term. It was very exciting to note that 72% of the students reached their first term goals, 80% thought goal setting helped them improve overall, and 82% thought goal setting improved their grade 7 year.

When asked if our work on the 3rd page of the report card helped with their commitment or in another area, 78% of the students said that it did.

"Yes, it made my goal seem important because it was on my report and my parents saw it. It made me more committed because my parents saw my goal and they knew about it. I want to show them that I can meet my goals" *(Alex - Grade 7 student)*

I believe the goal setting was tied directly to the students' initiative and independent learning through the specific steps taken to achieve their goals.

Following is a list of specific steps students planned to take. I believe they all illustrate initiative and/or independent learning.

I have also included the number of students who planned on using a particular step. They were easily tracked and recorded on the third page of the report card, and on the Student-Self Assessment Conference Form:

RESULTS OF STUDENT SELF-ASSESSMENT CONFERENCE FORM

- Ask for help / come in for extra help - 16 students
- Hand in work early - 11 students
- Add detail to written work - 6 students
- Complete homework - 5 students
- Listen carefully during class - 4 students
- Use marking scheme /rubric - 4 students
- Study /review work at home - 4 students
- Use agenda - 3 students
- Ask questions -3 students
- Improve attendance - 2 students
- Learn from weaknesses; advance to next steps - 1 student

Susan Young, GEDSB, 2001
PC Concepts 10/01

Summary

I believe that students asking for help, coming in for extra help, and handing their work in early had the greatest impact on student achievement.

In September, I had 29 students in my class. Over the course of the year four students have left, and five new students have arrived. I have included all the students into the program on-going in class, but only 26 are part of the tally for this research project. Upon reflection, I know that working through this action research project has helped with many of the positive changes my class and I have experienced. My students enjoyed being "important enough" to contribute their skills, ideas and thoughts to the education system where they often feel their voice is not heard. They present themselves as caring students, setting goals, planning steps to achieve goals and following through to meet them.

The Action Research Project helped me clarify a focus for change, to set my own goals. It provided an opportunity to share my ideas and frustrations with colleagues and to experience positive feedback on some of my ideas and insights. It also improved my motivation to reach my goals and to track results carefully so that I now know that I have made a difference to the students in my class. They have improved their initiative and their independent learning skills. Today the atmosphere in my classroom is relaxed and positive and as I reflect on the time I have spent with this class I feel it has been a great year that has flown by, not the long arduous year I was once anticipating.